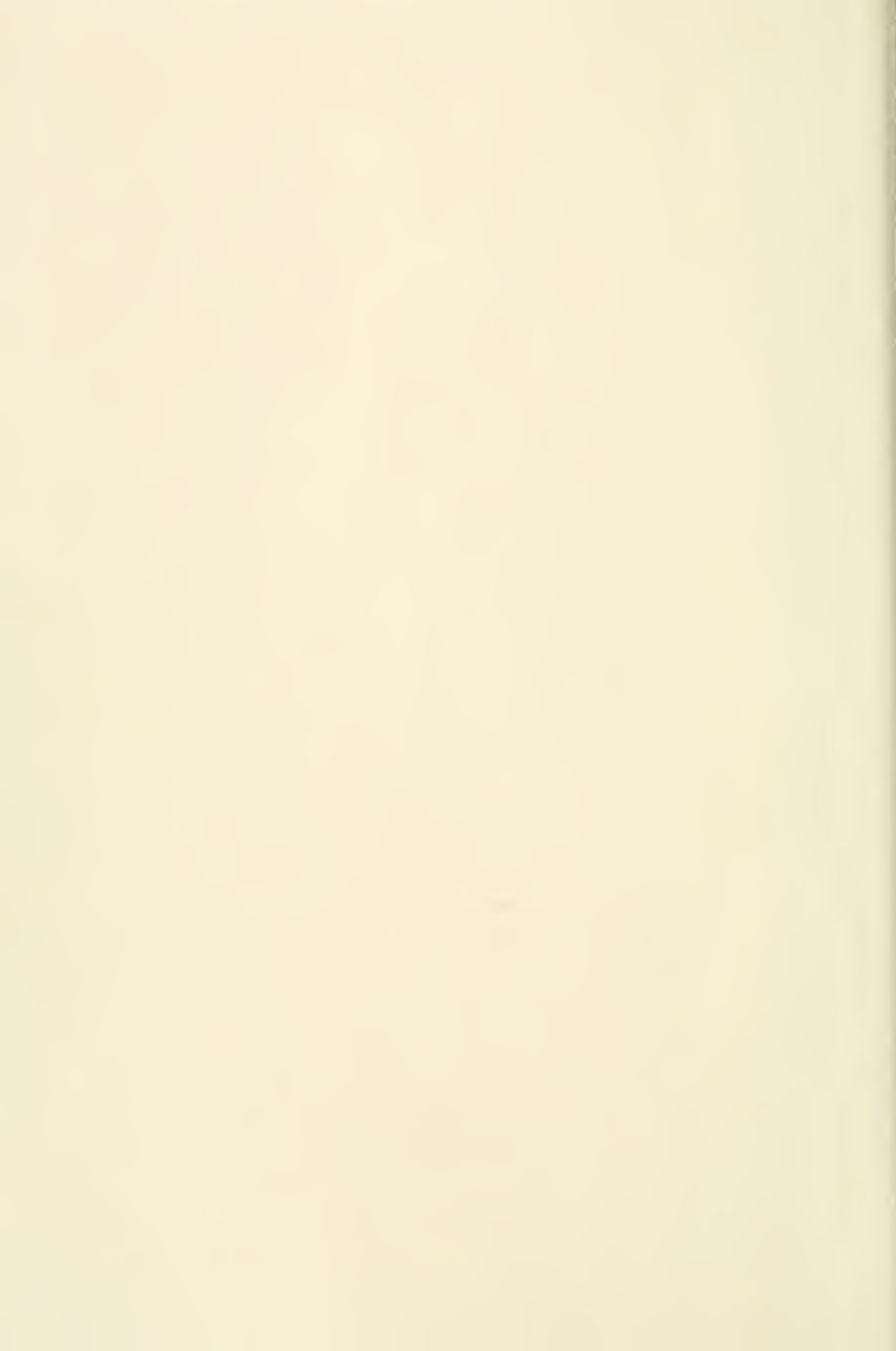


For Reference

Not to be taken from this room



Northeastern University Basic College Bulletin 1983-1984

College of Arts and Sciences
Boston-Bouvé College of Human Development
 Professions
College of Business Administration
College of Computer Science
College of Criminal Justice
College of Engineering
Lincoln College
College of Nursing
College of Pharmacy and
 Allied Health Professions
University College
 (Alternative Freshman-Year Program)

The New England Association of Schools and Colleges accredits schools and colleges in the six New England states. Membership in one of the six regional accrediting associations in the United States indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators. Colleges support the efforts of public school and community officials to have their secondary schools meet the standards of membership.

Northeastern University supports the efforts of secondary school officials and governing bodies to have their schools achieve regional accredited status to provide reliable assurance of the quality of the educational preparation of its applicants for admission.

The Northeastern University Bulletin (USPS 989-040) is issued at 360 Huntington Avenue, Boston, Massachusetts 02115, six times a year; once in January, twice in August, once in September, and twice in October. Second-Class Postage Paid at Boston, Massachusetts. Volume XI, Number 3, August 30, 1983.

POSTMASTER: send address changes to Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115.

The *Northeastern University Bulletin* contains current information regarding programs, curricula, cooperative education opportunities, career opportunities, campus life, and admissions, and such information is not intended to be and should not be relied upon as a statement of the University's contractual undertakings.

In reading this *Bulletin*, whether you are using it to make your selection of a college to attend or are trying to select a career goal, a major, a concentration, or even a course, you must keep certain important points in mind.

We at Northeastern will do our best to make available to you the finest education we can provide, the most stimulating atmosphere in which to learn, and the most congenial conditions under which you may enjoy the learning experience. But the quality and the rate of progress of your academic career are in large measure dependent upon your own abilities, commitment, and effort. You will be a full participant in an educational partnership. We will and, indeed, can only make the opportunities available to you; it is up to you to take advantage of them.

This is equally true with your career upon graduation. While we can offer the opportunity through an ever-improving co-op program for you to acquire work experience, which we believe will give you an advantage over some other applicants, we cannot guarantee that you will obtain any particular job. That will depend upon your own skills, achievement, presentation, and other factors, such as market conditions at that time. Similarly, in many professions and occupations, there are increasing requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These may change during the period of time when you are at Northeastern, and they may vary from state to state. While we will be ready to help you find out about these requirements and changes, it is your responsibility to initiate the inquiry because we cannot know what your expectations and understandings are unless you tell us.

In brief, what we are saying to you is that we are here to offer you educational opportunities and choices and to assist you in finding the direction in which you want to steer your educational experience. But you are a partner in this venture with an obligation and responsibility to yourself.

Northeastern University reserves the right in its sole judgment to promulgate and change rules and regulations and to make changes of any nature in its program, calendar, admissions policies, procedures and standards, degree requirements, fees, and academic schedule whenever it is deemed necessary or desirable, including, without limitation, changes in course content, the rescheduling of classes, cancelling of scheduled classes and other academic activities, and requiring or affording alternatives for scheduled classes or other academic activities, in any such case giving such notice as is reasonably practicable under the circumstances.

The University assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements, and acts of public authorities. (The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities, or performance, but its inability or failure to do so shall not subject it to liability.)

A Message from the President

Implicit in your decision to study at a university is a commitment to academic excellence and a desire to develop your full potential. Another important aspect of your decision is choosing which university to attend, and I'm delighted you've shown an interest in Northeastern.

For over eighty years, Northeastern has provided the highest quality education to thousands of men and women both inside and outside the classroom.

In the classroom our students are taught by a prestigious faculty, most of whom have doctoral degrees. It is a faculty eminently qualified to teach and dedicated to working closely with their students, to help them become well-rounded and knowledgeable citizens of the world. Faculty members receive an increasing number of basic and applied research grants each year. The courses they teach as well as overall programs are constantly reviewed for academic excellence and for relevance in our ever-changing society.

Outside of the classroom, our internationally known Cooperative Plan of Education affords Northeastern students the opportunity to apply academic expertise to paid jobs as closely related to their majors as possible. The "hands-on" experience students receive working in hospitals, industry, government, social service programs, law enforcement agencies, and other areas of employment, not only in Massachusetts, but across the nation and in foreign countries, provides them with distinct advantages for job placement upon graduation. In fact, many of our co-op employers ask our students to remain with them after graduation.

Approximately 200 athletic, social, political, religious, and cultural organizations provide students with still other ways to broaden their experiences and develop interpersonal skills.

Northeastern University is located in Boston, on public transportation routes and within walking distance of the dozens of historical and cultural landmarks that have made the city famous. The Museum of Fine Arts is just one block to our west, and Symphony Hall, home of the Boston "Pops," is one block to our east. Not too distant are modern government buildings, a renovated waterfront, and newly developed shopping areas such as the Quincy Marketplace that have "married" the best of Boston's past to its present.

I hope you'll visit our campus and explore those advantages I've briefly described. Should you decide to pursue your education at Northeastern, I look forward to greeting you.

Kenneth G. Ryder

President



Tuition and Regulations
Tuition rates, all fees, rules and regulations, courses, and course content are subject to revision by the President and the Board of Trustees at any time.

Northeastern University is committed to a policy of equal opportunity for all students and employees without regard to race, color, religion, sex, sexual preference, age, national origin, or handicap or veteran status. The University prohibits discrimination in all matters involving admission, registration, and all official relationships with students, including evaluation of academic performance. Northeastern is also an equal opportunity employer. The University also prohibits discrimination against any employee regarding upgrading, demotion, or transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training. In addition, the University adheres to affirmative action guidelines in the recruitment of students and employees.

Further, Northeastern will not condone any form of sexual harassment, which is defined as the use of unwelcome sexual advances, requests for favors, and other verbal or physical conduct of a sexual nature as an explicit or implicit condition of admission or registration, as the basis for academic evaluation, or when such conduct interferes with an individual's work or classroom performance by creating an intimidating, hostile, or offensive work or classroom environment.

Inquiries concerning our equal opportunity policies may be referred to the University Affirmative Action Officer, room 175 Richards Hall, telephone: 617-437-2139 or 437-2133.

Northeastern's efforts to comply with the Title IX Education Amendments of 1972 and Section 504 of The Rehabilitation Act of 1973 are coordinated by the Dean and Director of Affirmative Action.

The Committee on Admissions
Department of Admissions
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115
Telephone: 617-437-2200



This *Bulletin* has been designed to help you plan your education and career, as well as provide the information you need to apply for admission.

Naturally, we are enthusiastic about what Northeastern can offer: fully accredited programs in an exciting urban setting, plus something special—the unique learning experience of combined work and study at the institution that developed the Cooperative Plan of Education.

We encourage early application for admission and hope we can be of service to you.



Contents

	A Message from the President	3
	Admissions Welcome	5
Part I	About Northeastern	7
	The Philosophy of Education	8
	Boston and Northeastern	10
	The Boston Campus	18
	A Student's Voice	22
	Innovations in Curricula and Personalized Programs	24
	Research	27
	The Cooperative Plan	30
	Alumni Association	32
Part II	Academic Programs	33
	Undergraduate Majors	35
	College of Arts and Sciences	37
	Boston-Bouvé College of Human Development	106
	Professions	
	College of Business Administration	132
	College of Computer Science	151
	College of Criminal Justice	155
	College of Engineering	158
	Lincoln College	184
	College of Nursing	192
	College of Pharmacy and Allied Health Professions	196
	Basic College Compensatory Programs	215
	University College Alternative Freshman-Year	217
	Program	
	Other Schools and Colleges of the University	221
Part III	Particulars of Education	228
	Undergraduate Admissions	229
	College Expenses	240
	Financial Aid	244
	Honor Societies and Awards	268
	Housing	275
	Student Activities	277
Part IV	General Information	287
	ROTC: Military Officers Education Program	291
	Division of Cooperative Education	293
	University Libraries	297
	Office of Learning Resources	298
	University Health Services	299
	Curriculum and Instruction Services	300
	The Counseling and Testing Center	301
	Preprofessional Advising	301
	International Student Information	301
	International Student Office	302
	English Language Center	303
	Academic Computer Services	304
	Office of Services for the Handicapped	304
	Visitor Information Center	306
	Office of Parents' Services	306
	Academic Assistance Center	306
	The Governing Boards and Officers of	307
	the University	
	Academic Calendar 1983-1984	313
	Map	315
	Index	317

Part One

About Northeastern



About Northeastern

The Philosophy of Education

Northeastern University prides itself on offering "an education that works." The phrase is more than an advertising slogan. It is an expression of the University's commitment to preparing students for the realities of the working world through the practical learning experience of cooperative education.

Northeastern was founded nearly a century ago on the premise that higher education of the best quality should be made available to all who desire it. That founding principle is more alive today than ever before, as cooperative education provides students with an opportunity to help finance their own college education.

Aside from this very real financial benefit, cooperative education has many advantages. First and foremost is the experience students may gain working with professionals and learning about their chosen field of study. Students have a chance to test classroom theories and see if the career path they have chosen is the right one. When Northeastern students graduate, they often can present potential employers with résumés that reflect solid work experience and include meaningful references. And, as many as a third of Northeastern graduates are offered full-time permanent positions with their cooperative education employers upon graduation.

Cooperative education paves the way for an even broader partnership among Northeastern, other colleges and universities, industry, and government. It opens communication with the entire world community and stimulates increased activity through continuing education, research, development, and a myriad of community affairs. It is this growing partnership, beginning with cooperative education, that makes a Northeastern education such a pragmatic and boundless learning experience.



Boston and Northeastern

While cherishing its rich history, Boston keeps lively and up-to-date, thanks to the more than sixty colleges and universities within the greater metropolitan area. Students and faculty come from all over the country, and indeed the world, to Boston and Northeastern.

Although all of these educational institutions contribute to the vitality of the city, cooperative education at Northeastern adds a special dimension by taking the learning experience beyond the classroom walls to private companies, government agencies, and educational institutions. Every day, thousands of Northeastern students test classroom theories and enrich co-op employers through their infectious spirit of creativity and inquiry.



In turn, many of these employers direct their professionals to Northeastern to earn advanced degrees or to expand their skills. While many of the 19,000 students in University College are enrolled in one of the forty degree programs offered, increasing numbers are taking courses simply to improve themselves professionally rather than for degree purposes.

Aside from its role as an educational institution, Northeastern takes seriously its responsibilities to the City of Boston. The Northeastern Office of Community Affairs helps Boston residents to better utilize the university's human and physical resources. For example, facilities such as Matthews Arena, Barletta Natatorium, and the Eli Student Center accommodate many groups throughout the year for special events. Through innovative programs, Northeastern works with community groups to beautify the area, improve security, and create a general atmosphere of neighborliness.



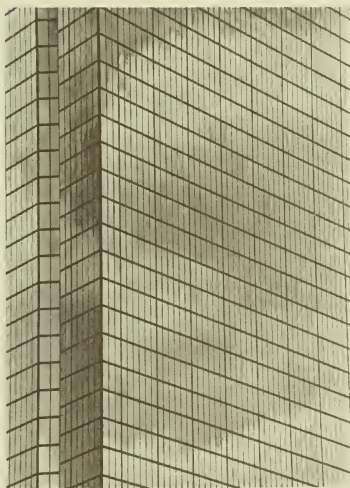


Follow the well-worn bricks of the Freedom Trail from Paul Revere's House to Faneuil Hall, Boston Common, and Beacon Hill. Browse in old book shops and wander through the art galleries of Newbury Street. Buy designer originals for an opening at the symphony, ballet, or opera—or jeans for a sail on the Charles.

Lose a day in the shops of the now-famous Quincy Market, sample the endless tastes of the North End restaurants and markets, indulge in Boston's world-renowned seafood.

Discover the architecture of the past in the State House, Back Bay, and Beacon Hill. Appreciate the boldness of the present in Government Center, Copley Square Plaza, the Prudential Center, and the Christian Science Center.

Enjoy.



Recognized throughout the world as a thriving intellectual and cultural center, Boston attracts bold thought and innovative art. Northeastern is located in the heart of the city and its students can and do take advantage of the many nearby opportunities for self-enrichment. Within walking distance are several colleges, including the Massachusetts Institute of Technology, Boston University, Simmons College, and Emmanuel College. Also close by are the Museum of Fine Arts, Symphony Hall, the Gardner Museum, the New England Conservatory of Music, the Christian Science Center, and the Boston Public Library.



The beat, the sparkle, the magic of professional theatre is only a subway ride away for Northeastern students. Beckoning to drama, music, and art students, Boston's theatre district lures theatre lovers from all over New England to share the excitement of Broadway-bound shows. It also provides imaginative and talented young artists with the opportunities to work alongside professional performers.



Say "Boston" to sports fans and immediately they think of the Red Sox, Celtics, Bruins, and Patriots. Indeed, many Northeastern students join the crowds at Fenway Park, Boston Garden, and Schaefer Stadium in Foxboro each year to cheer on these professional teams. In addition, there are crew races on the Charles River, tennis at Longwood Cricket Club in Brookline, and some of the best skiing in the country on the slopes of Vermont and New Hampshire.



**Boston is where
Northeastern is—and
Northeastern is Boston.**



The Boston Campus

Located on Huntington Avenue in the Back Bay section of Boston, the main campus of Northeastern University occupies approximately fifty acres, including the same land on which the Boston Americans and the Pittsburgh Nationals played the first World Series baseball game in 1903. Today, the University still provides ready access to baseball games; it is located close to the Fenway section and Fenway Park, as well as to cultural landmarks such as Symphony Hall, the Museum of Fine Arts, and the Boston Public Library, among others.



The "front door" to the campus is the Yard, or Quadrangle, facing Huntington Avenue, which is accessible to public transportation. The remaining sides of the Quadrangle are formed by Richards Hall, the El Student Center, and the Dodge Library. These three buildings were erected following an architectural design contest held in the early 1930s. Their white brick facades and clean lines form the nucleus of an architectural unit that is maintained throughout much of the campus.



The campus also reflects the fact that Northeastern is an urban university. Many University buildings bear the architectural design that characterizes the buildings surrounding the Quadrangle; other buildings have been acquired over the years and refurbished or recycled for the University's use. Many of these buildings were constructed before Northeastern selected its traditional architectural theme and reflect the more traditional warmth of old Boston.

The campus itself has been planned to provide freedom of movement within the central academic area of classroom and laboratory buildings. During the ten-minute break between classes, students and faculty are able to reach their next classrooms along the walkways and secondary streets that provide ready access to all centrally located buildings. In addition, a network of underground corridors connects many of the buildings on campus, providing routes that are especially convenient during periods of inclement weather.

During the early 1960s, large dormitory facilities were added diagonally across Huntington Avenue from the Quadrangle. In fact, Huntington Avenue currently forms an approximate divider between the education buildings on the south and the dormitories to the north.

Two blocks and a right turn away from the main quadrangle on campus is the oldest indoor ice-hockey arena in the United States and one of the focal points for amateur athletics in the Boston area. Today, the Matthews Arena is primarily devoted to hockey and collegiate sports, but has expanded its university athletic focus to include all men's basketball contests and many women's varsity contests. With more than a million and a half dollars already invested in the Matthews Arena, the building is a jewel to the eye and a credit to the community. As long as Northeastern owns the Matthews Arena, it will continue to meet the needs of the surrounding community as a superior recreational facility.

As the University continues to expand, parking and recreational areas are periodically relocated on the edge of campus as new buildings are added to the central academic area. At present, the University is planning construction around a second and new "front door" on the southwest border of the campus. In that area, a transit line will be relocated on the site of an old railroad line, and the station at Ruggles Street will also coordinate local bus routes and a suburban commuter rail line. This area is also the location of the newest housing facility on campus, West Hall, a ten-story apartment-dormitory.

Tentative plans for the future of the University include the construction of several new buildings as well as upgrading of the old. A new engineering building and a new library will not only provide more classrooms and research and study facilities, but will also physically form a quadrangle, the key design element of spatial organization at the University. The quadrangle will be an integral part of the new "front door" to the campus.

A building recently constructed is the architecturally dramatic addition to the Law School. This one-story structure is half below grade, opening into a sunken garden, and has a landscaped plaza on its roof. Over a block long, this plaza is a focal point and gathering spot for the west campus area. Adjacent to this site, a semicircular classroom building has also been recently constructed.

An ongoing renovation program is also providing more accessibility for the handicapped. Existing facilities throughout the University are being updated constantly to provide more efficient classroom, research, and office facilities while still retaining their traditional charm.



A Student's Voice

As I complete my third year, I am still not exactly sure why I chose to enroll at Northeastern over other schools to which I had been accepted. Looking back, I understand that it was no one single aspect of the school that led me to select Northeastern; rather, it was the unique combination of its individual qualities that brought me to my final decision. In retrospect, I can only conclude that Northeastern University was the correct selection for me.

I, like the University, feel I am growing. Northeastern University is going places. It attracts a breed of student that, like itself, is destined to succeed in future endeavors. Those who are not planning to succeed in life don't come to Northeastern, and if they do, they don't stay very long. The University encourages the professional development of the individual and ensures that the student's individual skills and qualities are practically applied in the work place during the course of his education.

Northeastern's world famous Cooperative Plan of Education allows the student to gain firsthand experience in his or her selected field. The student majoring in accounting, civil engineering, or biology, for example, leaves the University with over two years of practical work experience in the field, thus becoming a more competitive person in the job market. Northeastern has consciously geared its degree programs to post-graduation marketability, and its senior job placement record is clear testimony to its high success rate.

Co-op has helped me develop my own professional skills. As a supervisor with the company where I am employed, I have grown professionally and personally in a manner that is unattainable by my fellow students in most other universities. I will leave Northeastern University firmly rooted in the junior management of the company for which I am on co-op, while graduates from other schools will be in the beginning stages of the job-hunting process.

The nine basic colleges of Northeastern provide a faculty and curricula that by pure size alone allow a diversification a smaller school could not equal. Quality academic programs are developed with the intention of providing each student with a sound base on which to build a career after graduation. The spectrum of courses and programs offered allows for the evolution of a well-rounded professional.

Student activities add to Northeastern's diversification. I have enjoyed being president of the Student Government, the regional chairman of the Association of College Unions International, and the New England director of the American Student Association. In the past, I have served on the Social Council and in freshman government.

Complementing its academic and co-op programs, Northeastern University's location adds to the overall flavor of the school. Boston and its surrounding environs provide a collage of cultures and activities available to each Northeastern student. The Museum of Fine Arts, Symphony Hall, the Boston Garden, Quincy Marketplace, and so much more are but minutes from campus and allow each student to taste the many flavors of urban life.

The city is an integral part of Northeastern. Boston provides a setting in which the Northeastern student can live, work, and play—and many students do all three here. The value and growth that I have drawn from interacting in the city could not have been equalled at a school isolated from the urban environment.

I have found Northeastern to be a university in which to grow and learn. All of its elements combine to make it unique among New England and, indeed, other American schools. I am proud to be part of the Northeastern tradition, a tradition of quality, practicality, and excellence.

Paul Caruso



Innovations in Curricula and Personalized Programs

Coming from almost every state in the nation as well as numerous foreign countries, Northeastern faculty members are chosen for their enthusiasm, their scholarship, their teaching expertise, their ability to stimulate intellectual and scientific curiosity, and a genuine desire to work with people.

Northeastern faculty constantly reexamine and reevaluate curricula to keep pace with the changing needs of their students. As a result of this practice, many opportunities that few other institutions can provide are available here. For example, as a student in the College of Arts and Sciences, you may, if qualified, engage in undergraduate study not provided in conventional degree programs by developing an Independent Major with the assistance of a faculty adviser and the counseling services of the Dean's Office. More information on the Independent Major may be found on page 100.

In the College of Engineering, assistance in selecting courses and choosing a major begins in the freshman year. Faculty advisers, each responsible for a small group of freshman students, work under the direction of the staff of the Dean of Students, with the assistance of the Dean's staff in the College of Engineering. Upperclass students are assigned faculty advisers from their major departments. The College of Engineering curricula, under constant review by the departments, are frequently revised to keep current with developments in engineering fields. For example, computer engineering has been added to the Electrical Engineering Program. In addition, a series of courses in Alternate Energy Sources has been introduced into several of the engineering departments.

Lincoln College's Bachelor of Engineering Technology (BET) Program is distinctly different from typical engineering curricula. The technology programs provide an opportunity to prepare for what can be a unique and pivotal position on the professional-technologist-craftsman team. The freshman year of the BET program contains course work that can also be used as excellent preparation for entering colleges of engineering.

Recognizing the growing impact of computers and information technology, the College of Computer Science offers an exceptional educational opportunity to students because of its unique position as the only fully accredited, degree-granting academic unit in the United States dedicated to computer science and offering a cooperative education program. This newly established College awards the Bachelor of Science degree in Computer Science. In addition to its emphasis on excellence in the education of computer scientists, the College has been structured to complement the machine-oriented instruction with a high level of human interaction between the students, the Dean, and the faculty. In this atmosphere, the student is able to develop a strong rapport with members of the College's advisory staff and to receive valuable help as needed in defining professional goals.

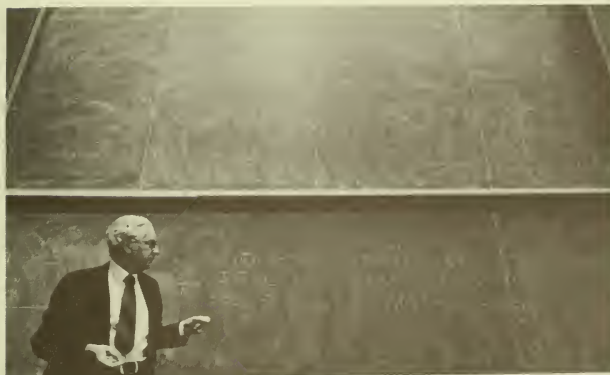
The College of Business Administration offers a variety of concentrations, plus an option for a self-designed concentration. If you need academic counseling, the undergraduate Business Office of the College offers its services on an open-door basis. There is also a Student Advisory Committee, which represents your interests and viewpoints and prepares teacher/course evaluations.

The University's Boston-Bouvé College of Human Development Professions offers major areas of study in Elementary and Secondary School Teaching, Human Services, Speech and Hearing, School and Community Health Education, Physical Education, Physical Therapy, and Recreation and Leisure Studies. Physical Education students may prepare for elementary or secondary school teaching with options for special concentrations in athletic training, coaching, gerontology, and adapted physical education. There are nonteaching physical education options in cardiovascular health and exercise and sports communication. The Health Education Program offers the opportunity to prepare for teaching in public schools or working as a health educator in a community agency setting. Recreation and Leisure Studies students may select a specialization from one of three tracks: Therapeutic Recreation, Recreation Management, or Outdoor/Environmental Education and Recreation. The Department of Physical Therapy offers one of the few programs in the United States developed on the cooperative education plan with alternating work-study experiences related to the curriculum, thus strengthening classroom and laboratory learning. In fact, all programs in the college are offered on the five-year plan.

Cooperative work experience is particularly important for students in the Boston-Bouvé College of Human Development Professions. Opportunities are available for selected students to receive assignments in cooperative school systems, community or government agencies and institutions, hospitals, or libraries. In these settings, students may enjoy unique experiences that greatly enhance self-confidence and professional growth.

Boston-Bouvé College of Human Development Professions and the College of Arts and Sciences offer an undergraduate major in Human Services to students who, in addition to meeting the requirements of their "home" college, take courses in both colleges. In their junior and senior years, Human Services majors must participate in supervised work experiences. For details of the program, see page 130.

Northeastern's College of Nursing programs were the first in the country to be offered on a co-op basis. Through affiliation with health-care agencies in the Greater Boston area, students are provided a variety of opportunities to acquire clinical experience. Students are assigned a faculty adviser to assist in their career development. The College encourages student representation on the majority of its standing committees.



Students in Allied Health Professions may prepare through classroom study and clinical experience to assume a professional role in one of today's health fields.

If you are interested in pursuing a career in the health-care professions, but are undecided as to which profession is right for you, then explore the Open Option. The Open Option program offers freshmen a core of courses designed to provide a basic scientific background required for each of the professional programs in the College of Pharmacy and Allied Health Professions. In the Open Option plan, you may complete the core courses in the first-year curriculum without selecting a profession in which to major and without loss of valuable time. Upon satisfactory completion of the first-year courses, you then select a professional area in which to major.

If you decide to major in Pharmacy, you may select courses in clinical and hospital pharmacy, community pharmacy, or areas that may give you the opportunity to prepare for a research career in one of the pharmaceutical sciences. The community pharmacy externship and clinical pharmacy clerkship courses help to provide additional practical experience beyond the standard co-op assignments.

Medical laboratory science is an area of health care concerned with the laboratory examination of material necessary for the proper monitoring of health and for the diagnosis and treatment of illness. Working in a variety of specialized fields, such as microbiology, blood banking, hematology, or clinical chemistry, or as a generalist in all these areas, medical laboratory technicians and technologists are respected and important health professionals. Northeastern's program in Medical Laboratory Science offers you the opportunity to prepare for laboratory duties at several levels by combining internship with co-op positions or part-time jobs during your baccalaureate degree program. Upon graduation, you may wish to take national certification examinations or pursue a graduate study program.

The Health Record Administration program offers you the opportunity to prepare for a variety of positions in the area of documentation of health care.

The Respiratory Therapy program helps to prepare students for careers as life-support specialists. The curriculum leads to a Bachelor of Science degree in Respiratory Therapy.

A Bachelor of Science degree program in Toxicology is also offered by the College of Pharmacy and Allied Health Professions. This program emphasizes the areas of environmental principles in toxicology, thereby helping to educate students for advanced studies and employment opportunities in clinical, government, and industrial settings as they relate to medical and environmental problems.

The Cooperative Plan and a combination of applied and theoretical courses contribute to the academic program at the College of Criminal Justice. Graduates have found careers in law enforcement, private security, criminalistics, corrections, and rehabilitation and social services, as well as in many other areas of the criminal justice system. Because of the academic nature of the program, many graduates have enrolled in law school or undertaken graduate study in criminology, public affairs, and social work.

It has been said that "the most essential thing in the work of education is that sympathetic touch of life on life. It is by that fine process that personality is developed, matured, and enriched. . . ." One reason for the success of the Cooperative Plan at Northeastern University is that

"touch of life on life," which is made possible by the close association between the more than 800 scholars on the faculty of the Basic Colleges and their students. When you enter Northeastern, you are assigned an academic adviser who works with you during your freshman year on a wide variety of matters concerning your personal and academic development. Advisers are also available for academic counseling throughout your upperclass years. Obviously, it is the student's responsibility to take advantage of these opportunities.



Research

Research, whether performed in the laboratory, library, or in the field, is vital to a college education. It stimulates all participants and ensures a thriving academic atmosphere. Through research, faculty members as well as students stay abreast of the most recent developments in their particular fields. Faculty who disseminate this knowledge, through publishing, speaking, and teaching, help assure a university education of the first order.

At Northeastern, we take research and scholarly endeavors very seriously. Each year, more faculty receive funding for an ever-increasing number of research projects. Sponsorship comes from a variety of places. Federal agencies, private industry and foundations, and the University itself all contribute to Northeastern's growing research emphasis.

While much of this research is carried out by the faculty members, their graduate students, and post-doctoral research associates, ample opportunities also exist for undergraduate students. Research participation can be included as part of regular academic programs, as specially designed independent studies, or through cooperative work assignments. Research activities are encouraged and limited only by the student's own motivation and curiosity.

Northeastern University has numerous distinguished faculty members, many of whom have received prestigious awards, including Sloan Scholarships, Guggenheim Fellowships, and National Institutes of Health Research Awards. Faculty members lecture the world over—from just

across the Charles River in Cambridge, Massachusetts, to across the Pacific Ocean in Sydney, Australia.

Additionally, many faculty serve as United States government consultants and participate on a variety of national and international committees.

But, because Northeastern considers education its primary mission, you'll always find an enthusiastic and accessible faculty to answer questions, solve problems, and stimulate your mind.

Current research spans almost every academic and professional field and is not limited to laboratory investigations or the "hard" sciences. Every department of every college at Northeastern carries out some basic or applied research projects.

A brief summary of some of the topics presently under investigation by the faculty and students follows. Perhaps something here will spark hidden interests that you never realized you had. If you'd like to explore the opportunities for research participation, you should inquire at the appropriate departmental offices.

In the College of Arts and Sciences research projects reflect the diversity of its seventeen departments. Research in the humanities and the natural and social sciences includes studies in 19th-century Boston architecture, the off-off Broadway theatre, cable TV, quantum field theory, and infrared spectroscopy.

As part of the College's interdisciplinary interest in marine sciences, the Marine Science and Maritime Studies Center has been established. At its Nahant field station and laboratory, faculty and graduate students carry on research in marine chemistry, biology, and botany.

Research in the College of Engineering encompasses some of today's hottest technological subjects. Robotics, telecommunications, space rocketry design, and the latest in computer graphics are major fields of interest within the College. But not all studies are high technology oriented. Indeed, some faculty pursue projects dealing with the electrical properties of human blood vessels, while others investigate the components of Venezuelan red mud. These seemingly diverse research areas do have one thing in common, however: they deal with the improvement of our quality of life.

The College of Criminal Justice is one of the few institutions of its kind in the United States to study crime and law in an interdisciplinary fashion. Lawyers, social and forensic scientists, and system specialists are encouraged by the College to participate in research activities focusing on both crime detection and prevention. Some research directions currently pursued by faculty include industrial espionage, private security systems, and contemporary terrorism.

The School of Law's research activities concentrate on the legal system from a perspective encompassing the past, present, and future. Topics include an historical look at the Securities and Exchange Commission, a present view of new civil procedures, and some future musings on the effects of a landmark court case on the mental health profession. Law school curricula also come under investigative scrutiny.

The nature of research in Boston-Bouvé College of Human Development Professions is broad in range and diverse in approach. Changes in human development and the roles of the teacher and clinician in facilitating such changes are lively topics of interest being examined across a wide spectrum of theoretical and applied research. Some of the current research interests of faculty and students include the communication abilities of normal and hearing-impaired individuals, the role

of exercise in cardiovascular health and disease, the relationship between age change and the development of motor and cognitive skills in children, the evaluation of clinical practice in physical therapy and educational practices in the schools, and the examination of barriers to the employment of the disabled in leisure services.

The School of Nursing, through its research activities, addresses some of the important problems currently facing the entire nursing profession. Assessments of new directions in nursing as well as other employment possibilities and problems are areas in which the faculty are directing their research efforts.

Research objectives in the College of Pharmacy and Allied Health Professions have important ramifications for everyone's better health. Studies include investigating new ways to analyze antidepressant and anticonvulsant drugs, improving methods to diagnose bladder cancer, and studying clinical applications in respiratory therapy. The National Institutes of Health, Dow Chemical Company, and the American Heart Association sponsor some of this work.

Research within the College of Business Administration divides itself between the theoretical and practical aspects of management, human resources, and marketing. New ideas in corporate practice and academic theory are being realized through conclusions reached by a faculty examining such topics as high technology management, small business entrepreneurship, and foreign investment in developing countries. Other studies concentrate on transportation problems in the U.S., government regulation in industry, and technological forecasting in high technology firms.

Northeastern University is its own research subject for the Cooperative Education Research Center. Through an annual census and other statistical surveys, data on cooperative education are compiled. Because Northeastern University is a major force in cooperative education in this country, it seems only appropriate that this information clearinghouse and research facility should be located here. Conclusions reached may affect your own education, since they cover cooperative education's impact on college costs, career opportunities, and life satisfaction.

To meet the needs of the entire academic community, Northeastern also has several interdisciplinary centers and institutes. While not granting degrees, they perform a variety of interesting and relevant research.

The Institute of Chemical Analysis, Applications, and Forensic Science has as its goal basic research in the fields of analytical chemistry and material science and its application to problems of social relevance. The Institute has developed an international reputation in the fields of chromatography, mass spectrometry, amorphous metals, and solar-energy storage devices.

The Center for Electron Microscopy is a self-contained research unit that utilizes the latest scientific equipment for training and research in cellular and subcellular structures.

Research on critical issues in education and a forum for the exchange of ideas and information are provided through the Institute for the Interdisciplinary Study of Education where research deals with the high technology industry, South African education, and community college programs for prisoners.

The Center for Applied Social Research is a University-wide institute that deals with issues of public policy and social research. Projects are presently under way in the fields of criminal justice, public safety, mental health, social welfare, and education.

The Cooperative Plan

The Cooperative Plan brings relevance to your college education. By offering a schedule that alternates classwork and off-campus experiences, Northeastern helps you to realize your potential and develop personal maturity. The process itself—as you compare classroom theory with its realistic application—enlivens classwork. Upon graduation you will have not only a degree, but also up to two years of valuable experience to offer a potential full-time employer. In addition, the money you earn on cooperative assignments can help to defray the cost of tuition, books, and incidental expenses.

You will be assigned a faculty coordinator who is responsible for all phases of your cooperative program and who will assist you in deriving greater value from your education at Northeastern. Personal interviews, in which your academic progress and evaluations of your previous work experiences are reviewed, provide the basis for referral to specific opportunities that could help you realize your career objectives. Your coordinator is a specialist who keeps abreast of activities in specific areas in order to provide counseling on opportunities and trends in these areas. In general, starting assignments tend to be of a routine nature, to be followed by increasingly professional applications as your education and abilities increase. Subject to economic conditions and your willingness to consider alternative opportunities, you can expect to work on responsible and challenging assignments during your participation in the program.

At some point in your program, you may wish to participate in an activity other than paid employment during a cooperative period. You may wish to travel abroad, spending time in one or several foreign countries learning about the customs, the culture, and the people. You may wish to volunteer your services to your local hospital or spend some time on an Indian reservation in the Southwest. Or you may wish to take specialized courses at another institution. Time to engage in these and similar activities can be arranged with your coordinator as a part of your Cooperative Education Program.

Most cooperative curricula leading to the baccalaureate degree require five years. Programs consist of a freshman year of three consecutive quarters of full-time study followed by four upperclass years in which you alternate periods of classroom attendance at Northeastern with periods on cooperative assignment. Some programs vary slightly from this pattern to meet professional requirements in their particular fields.

Associate degree programs in Allied Health Professions require three years to complete, with two upperclass years on co-op.

Participation in the Cooperative Plan is a requirement for all students in the Basic Colleges except those enrolled in the College of Arts and Sciences. Although the majority of students in the College of Arts and Sciences choose to take advantage of the Cooperative Plan, the College offers its students the opportunity to select a "full-time" program in which eight quarters of upperclass study may be completed in three years.

Further details on the cooperative program are available in a booklet entitled *Co-opportunities*, which the Department of Admissions will be happy to send you on request.



Alumni Association

More than 90,000 alumni are united within the Alumni Association, created to establish a mutually beneficial relationship between Northeastern and its graduates. The Association is governed by an Executive Committee elected from the alumni community. Membership in the Association is automatic upon graduation.

The Association is headquartered in the Office of Alumni Relations in 125 Richards Hall; telephone 617-437-3186. The official records and addresses of alumni are maintained in the Office of Alumni Records; telephone 617-437-2792.

Activities of the Association include the Homecoming celebration, presentation of the Outstanding Alumni Awards, and the annual presentation of Professional Promise Awards to outstanding seniors in each of the Colleges. Alumni officers, in conjunction with the Office of Alumni Relations, have established a series of enrichment/education programs to meet the contemporary vocational and avocational needs of Northeastern's graduates. The Alumni Association has also initiated a successful group travel program to provide the alumni of Northeastern with interesting and economical opportunities for foreign travel. Notice of all activities is provided in the *Northeastern Alumni Magazine* and in special publications.

Regional alumni clubs have been established from coast to coast. All alumni are eligible to become members of these organizations. The clubs meet periodically with varied programs, often in conjunction with professional and athletic events, faculty visits, and service projects. Additionally, alumni class organizations conduct reunions for their respective classes every five years.

The Association sponsors and assists constituent organizations that focus on common professional and avocational interests and college affiliations. These groups have their own officers and conduct various programs throughout the year.

Regional alumni clubs provide a valuable service to the University by sponsoring admissions conferences for high school students and the parents of students who are interested in attending college. In addition, alumni volunteers in many metropolitan areas across the nation represent the Admissions Office on a continuing basis at high schools and community colleges.

Part Two

Academic Programs



Academic Programs

Quarter-Hour Credits

Northeastern University operates on a quarter-system calendar. All courses are evaluated in terms of quarter-hour credit. A quarter-hour credit is equal to three-fourths of a semester-hour credit.

Classes at Northeastern are scheduled in different modules.

In assessing quarter-hour weights for courses, the following statement applies.

One quarter hour of credit is equal to fifty minutes of instruction per week, plus two hours of preparation.

Undergraduate Majors

College of Arts and Sciences

Bachelor of Arts or Bachelor of Science

African-American Studies

Art

Biology

Chemistry

Drama

Economics

English

Geology

History

* Human Services

Journalism

Linguistics

Mathematics

Modern Languages (French, German, Italian, Russian, Spanish)

Music Literature

Philosophy

Physics

Political Science (including a concentration in Public Administration**)

Psychology

Sociology-Anthropology

Speech-Communication

* Bachelor of Arts only

** Bachelor of Science only

Boston-Bouvé College of Human

Development Professions

Bachelor of Science in Education

Early Childhood

Elementary Education with a minor in Special Education with emphases in:

Humanities

Reading-Language

Social Sciences

Human Services

Physical Education

School and Community Health Education

Secondary Education Majors:

Biology

English

General Science

Mathematics

Social Studies

Speech and Hearing

Bachelor of Science in Physical Therapy

Bachelor of Science in Recreation and Leisure Studies

College of Business Administration

Bachelor of Science in Business Administration

Accounting

Entrepreneurship and New Venture Management

Finance and Insurance

Human Resources Management

International Business Administration

Management

Marketing

Transportation and Physical Distribution Management

College of Computer Science

Bachelor of Science in Computer Science

College of Criminal Justice

Bachelor of Science in Criminal Justice

College of Engineering

Bachelor of Science

Chemical Engineering

* Civil Engineering (Environmental option available)

* Electrical Engineering

(Computer Engineering and Power Systems options available)

Industrial Engineering

* Mechanical Engineering

Unspecified-general engineering program

* Also offered as part-time evening program

Lincoln College

Bachelor of Engineering Technology

(Five-Year Day Cooperative Program)

Computer Technology

Electrical Engineering Technology

Mechanical Engineering Technology

Transfer, Day Cooperative Program

Aerospace Maintenance Engineering Technology

College of Nursing

Bachelor of Science in Nursing

A Transfer full-time day program for Registered Nurses who want to earn their Bachelor of Science in Nursing

College of Pharmacy and Allied Health Professions

Bachelor of Science

Health Record Administration

Medical Laboratory Science

Pharmacy

Respiratory Therapy

Toxicology

Associate in Science

Respiratory Therapy

Open-Option: Common freshman-year health track available for undeclared majors

University College

Alternative Freshman-Year Program (Self-Paced Program)

Degree requirements: 172–222 quarter hours (requirements vary with major).

College of Arts and Sciences

Richard Astro, Ph.D., *Dean*

J. Edward Neighbor, Ph.D. *Associate Dean and Director of Graduate School*

Joanne Loscalzo, M.A., *Assistant Dean (Curricular Affairs)*

Timothy P. Perkins, M.A., *Assistant Dean (Special Projects)*

Ruthann T. Stiles, M.A., *Assistant Dean (Financial Affairs)*

Deborah H. Stein, M.Ed., *Assistant Dean (Graduate and Undergraduate Student Affairs)*

Mary Mello, M.A., *Assistant to the Dean (Undergraduate Student Affairs)*

Gail F. Leclerc, M.Ed., *Assistant to the Dean (Graduate Student Affairs)*

Program Aims

Studies in a broad distribution of disciplines in Arts and Sciences are universally regarded as the core of higher education. For this reason, nearly all students in the University—no matter what disciplines they choose for their career training—devote a substantial portion of their studies to the arts and sciences.

The College of Arts and Sciences comprises a wide variety of disciplines spanning an enormous range of human knowledge and activity. These disciplines are grouped informally into divisions as follows: 1) Fine Arts, 2) Humanities, 3) Natural Sciences, including Mathematics, and 4) Social Sciences. The College as a whole emphasizes the general education of students; within each division, the disciplines tend to offer a common preprofessional orientation and emphasis.

In addition, the College offers a large number of interdisciplinary programs as well as extradisciplinary opportunities for the enrichment of learning. These are grouped into a division of Special Programs. The division includes exchange programs with other institutions, both nationally and internationally, for employment and/or study; programs for extended studies in field settings at sea and abroad; and cultural programs involving affiliations with professional performing arts organizations—to name a few. At present the division comprises over thirty different special programs of various types.

Graduates of the College find they are prepared for a multitude of employment opportunities in all walks of life. Many choose to accept employment directly, following receipt of the Bachelor's degree. Many others choose to continue their training by going on to graduate-level studies in business, law, or medicine, for example. Others decide to pursue advanced study in an area closely related to their undergraduate field.

Four- and Five-Year Programs In all disciplines, students of the College have the option of choosing a four-year full-time program or the five-year Cooperative Plan. The five-year plan offers opportunities for regular "real world" employment and income in an area often related to the chosen area of academic work. All students are normally eligible to participate in the Cooperative Plan when they achieve sophomore status.

Major Programs

Entering students are invited to express a "major preference" for one of the disciplines, and this, together with the core requirements of the College, determines the course of studies in the first and second years. There is considerable flexibility, however, and students often change their preferences during this period. Formal certification of the major choice normally takes place at the beginning of the third year, when the transition to the "upper division" of the College occurs.

Students entering the lower division of the College may wish to petition later for transfer to the upper division of the College of Business or the College of Computer Science. Arts and Sciences freshmen with this intention should indicate "Business" or "Computer Science" as the initial major preference.

Students in the College may earn a Bachelor of Arts degree in all major programs or a Bachelor of Science degree in most major programs.

Honors Program

The Honors Program of the College exists to meet the needs of highly motivated and especially successful students. It is an optional program providing an assortment of special courses and activities for students who are invited, and who choose, to participate.

The Honors Curriculum consists of 1) some of the courses required for all students, such as English and Mathematics, 2) interdisciplinary and survey seminars as honors alternatives for elective courses, 3) one-credit-hour "mini-courses" on a wide variety of subjects, and 4) the opportunity for students to undertake a special Honors Project under the supervision of a faculty adviser in the junior and senior years.

The Honors Program is designed to be consistent with participation in the other programs of the College, including all of the Major Programs. The Honors Program may make extra demands, but because the courses are limited in size, aim for greater than usual breadth and depth of inquiry, and promote close interaction between faculty and students, the program offers especially stimulating educational opportunities.

A student's participation in any honors course is noted clearly on his or her transcript—something that may help when making application for employment or admission to graduate school.

The Honors Program also sponsors, through the efforts of an advisory council of students in the program and a faculty honors committee, a number of cultural and social events, as well as a speaker series. Some of these events are made available by the program for the benefit of the entire University community. Others afford honors students alone the opportunity to associate with peers in circumstances less formal than the classroom, where they can get better acquainted and participate in the casual discussions that make up such an important part of a university education.

Advising and Placement

Upon acceptance to the College, students are placed into freshmen and sophomore courses designed to suit their abilities, needs, and prospective major affiliations. The placement process involves close consultation between students and faculty advisers from the major disciplines.

The particular studies advised for freshmen fall into several placement categories, as follows: 1) honors, 2) regular, 3) regular with modification, and 4) special. The latter two categories may require that students undertake studies in skill development to improve their chances of success in college. These placements are determined by faculty, subject to review by consultation during Orientation Week, before classes start in the fall quarter. Continued monitoring and mentoring by faculty and/or staff advisers aid students appropriately in preparing to enter their major fields of study.

As in the freshman year, faculty guidance is available to upper-class students for maintaining satisfactory academic standing and gaining entry by petition to a major field of specialization. After the major choice is certified, students are formally affiliated with their department, its faculty, and other students in the same major field.

The Arts and Sciences Dean's Office, located in 403 Meserve Hall, is the central administrative office for all students majoring in Arts and Sciences programs. In addition to the academic counselors located in the various departments, the Dean's Office staff is available to all students for academic assistance. The counselors in the Dean's Office work closely with departmental advisers to help the student work out a program of study and take care of any problems that may arise relating to administrative procedures. The Dean's Office is open from 8:30 to 4:30, Monday through Friday, during the fall, winter and spring quarters, and from 8:00 to 5:30, Monday through Thursday, during the summer. Students are encouraged to make appointments with counselors at any of these times. The phone number is 437-3980.

Student Services

Cahners Hall Math/Writing Center All mathematics and English remedial courses are taught in classrooms in Cahners Hall, the new Math/Writing Remediation Center. The facility includes a Writing Center and a Math Workshop, where students may receive individual tutoring. In addition, Cahners Hall has five computer terminals and a printer which are used to teach problem-solving strategies in the remedial math courses.

Program Descriptions and Regulations The following pages briefly describe each major discipline in the College of Arts and Sciences. Within each division of the College, the disciplines are listed in alphabetical order. Summaries of the divisions can be found on the following pages: Fine Arts, page 41; Humanities, page 46; Natural Sciences and Mathematics, page 59; Social Sciences, page 73.

A summary of the Special Programs in the College can be found on page 94. Following this is a brief description of each of these programs, listed in alphabetical order.

Finally, a summary of general College conduct can be found on page 290. A more complete account of the regulations can be obtained from the Dean's Office of Arts and Sciences.

A complete listing of individual courses offered by the College, including a short description of contents for each course, is given in the *Basic Day Colleges Course Descriptions and Curriculum Guide*, obtainable from the Registrar's Office.

Preprofessional Advising The Pre-Health Professions Advisory Committee, a University-wide group, offers preprofessional counseling for students interested in a career in medicine, dentistry, or related professional medical fields. The Committee members are available to discuss the various medical fields, minimum admissions requirements, and application process.

For students preparing for a career in law, there are also a number of faculty members who can serve as advisers and resource personnel on related curricular and admissions questions.

In addition, the Department of Career Development and Placement provides information and advice on procedures for admission, preparation of applications, and the scheduling of appropriate admissions tests. For further information regarding the above, students should contact Ms. Gail Leclerc in the Arts and Sciences Dean's Office.

Fine Arts

To try to define the boundaries of an academic discipline is to invite controversy. This is nowhere more true than in the field of the arts. However, one can say that the term "arts," used without qualification (as in "Arts and Sciences"), refers to such disciplines as languages, literature, and philosophy that are presumed to develop general intellectual ability and judgment and provide information of general cultural concern.

Education in the arts is thus distinguishable from education in the sciences—which emphasizes knowledge of objective facts and laws—and especially from narrowly practical training, as for a particular profession such as law or medicine.

The term "Fine Arts" refers specifically to those disciplines concerned primarily with works produced or intended for beauty rather than mere utility. Thus, the term includes (but is not limited to) activities such as sculpture, painting and drawing, and, often, architecture, drama, music, and the dance.

In the College of Arts and Sciences, the major disciplines comprising the Fine Arts division are as follows:

Art and Architecture page 41

Drama page 43

Music page 45



Art and Architecture

Peter Serenyi, Ph.D., *Professor and Chairman*

Professor

Robert L. Wells, M.A., M.F.A.

Associate Professors

Samuel S. Bishop, M.A., M.F.A.

Wheaton A. Holden, Ph.D.

Assistant Professor

T. Neal Rantoul, M.F.A.

Professional Preparation

Aims The visual arts, humankind's oldest form of artistic expression, offer a deeper understanding of man and the cultural forces that have affected him historically. Moreover, as visual communication becomes more widespread in the contemporary world, the use and understanding of visual language must be seen as a necessary part of the educational process.

In view of this, the aim of the Department is threefold: (1) to introduce art and architecture both as history and as creative activity in the context of a broad liberal arts education; (2) to offer a more focused study of the visual arts through a critical examination of both the language and content of art and architecture in the context of a particular historical period, or through the hands-on experience of a studio setting; and (3) to provide an opportunity for a solid academic foundation to those who wish to pursue a career in art and architecture, or related fields.

One of the main resources of the Department is Boston itself, whose architecture spans three hundred years, whose museums are world famous, whose galleries and cinemas offer the latest in their respective areas, and whose public library is one of the best of its kind. Learning to use these resources systematically is an all-embracing aim of the Department.

Description of the Major The Department offers three concentrations within the major: (1) history of art and architecture, (2) studio art, and (3) architecture. Courses in the history of art and architecture cover the major periods of the Western World from Ancient to Modern, with a focus on 19th- and 20th-century Europe and America.

The studio concentration includes painting, drawing, printmaking, architecture, film, and photography. Studio courses are complemented by courses offered in the theory and criticism of these art forms. The best work created in the studio courses is exhibited in the annual student show at the University Art Gallery.

The architecture concentration consists of courses in the history and theory of architecture and architectural design. Except for Introduction to Architectural Design, all design courses are to be taken at the Boston Architectural Center at 320 Newbury Street, Boston.

A View of the Major The Department offers both a Bachelor of Arts degree and a Bachelor of Science degree program. In both programs the requirements for the major are the two-part survey course in art history, twelve electives in art and/or architecture, plus one elective each in music and philosophy and two in history. With prior approval, art courses not offered by the Department may be taken in one of the neighboring art schools or universities.

Majors may pursue either a four-year full-time program or a five-year cooperative plan of study. Transfer from one to the other is possible, and registration in either can be reversed. Cooperative work assignments include positions in museums, libraries, historical collections, archives, and the Northeastern University Art Gallery.

A View of the Minor The Department offers a minor program for students majoring in other fields of study. The program consists of a general minor and the following four concentrations: history of painting, architecture, film and photography, and studio art. The number of courses required for the minor does not exceed seven. Students interested in the minor program should consult the Department.

Special Programs

See Center for Asian Studies, Boston Architectural Center Affiliation, Division of Fine Arts, Humanities Center, Independent Major, Irish Studies, Media Services Minor, Urban Studies Minor, and International Co-op.

Drama

Sergei P. Tschernisch, M.F.A., *Professor and Acting Chairman*

Professor

Eugene J. Blackman, M.A.

Mort S. Kaplan, M.A.

Associate Professor

Jerrold A. Phillips, Ph.D.

Assistant Professors

Janet L. Bobcean, M.F.A.

Michael Brill, M.F.A.

James J. Moran, M.F.A.

Ingrid H. Sonnichsen, M.A.

Professional Preparation



Aims Theatre, one of the most ancient of all art forms, is still a moving force in our society because it uniquely involves the spectator to a degree unmatched by most creative and communicative arts.

At Northeastern, students in Drama are offered the opportunity to prepare for careers in educational and professional theatre, as well as to prepare for advanced study at a graduate institution.

Description of the Major The undergraduate Drama major will be introduced to the total theatre experience, as well as its individual arts and crafts.

Theatre history, dramatic literature, play writing, as well as acting, directing, technical production, scene design, lighting design, costume design, voice control, and stage movement are only some of the areas covered in classroom courses. Theory will be tested in the theatre laboratories—the stages and their shops. Drama majors are encouraged to express individual creative and interpretive impulses in courses, laboratory classes, and with the working crews and casts of productions. Advanced students will be urged to demonstrate abilities in independently organized, but faculty-supervised, projects in acting, play writing, criticism, directing, and design.

A View of the Major The difference between the B.A. degree and the B.S. degree is one of flexibility and concentration. The B.S. degree allows the substitution of specialized field courses for certain of the College's general and language requirements.

However, there are minimum requirements for both degrees, with sixty quarter hours to be taken in the major area. Thirty-two quarter hours are to include Theatre History I and II, Stagecraft, Acting I, Dramatic Theory and Criticism, Directing I, and Practicum in Play Production. Beyond these basic courses, a major selects and completes a minimum of twenty-eight quarter hours of advanced work within one of three tracks: Acting/Directing, Technical Theatre, or Play Writing/Dramatic Criticism/Theatre History.

The theatre represents the major public laboratory to the Drama major, a place where theory is put into practice. All majors are expected to work in production each quarter in residence and fulfill a variety of crew assignments in construction, painting, sound, lighting, sewing, and ticket selling, as well as crew assignments for the running of a show—wardrobe, makeup, props, scene shifting, ushering, and house managing. Whenever possible, majors are expected to serve as stage managers and assistant stage managers. Appearing in a production is not a substitute for crew work and, when reasonably possible, all those concentrating in a performance aspect should also participate in crew activities.

It is recommended that the Drama major have at least a basic familiarity with other creative arts as well as the basic humanities. When practicable, the major should take course work in the following areas outside the major field of concentration: music, art, philosophy, and American and English literature.

It is also recommended that Drama majors take a Physical Education *skill* course during each of the quarters in residence. The following courses, when available, are recommended: Modern Dance, Ballet, Jazz Dance, Tumbling, Gymnastics, Judo, Boxing, Wrestling, Fencing, Weight Training, Physical Conditioning, Exercise and Physical Control, or Swimming.

A few places in upper-class performance courses are kept available for freshmen students.

Description of the Minor Students majoring in other departments may choose a minor in Drama to complement their academic majors or to assist them in developing career goals by taking eight courses (thirty-two quarter hours). Closely supervised by a Drama faculty adviser, students may follow programs of study that offer a generalized or a specialized program. Specialized areas are in performance, technical theatre/design, and drama literature and criticism.

Accreditation Basic course work offered by this Department adheres to the suggested minimum requirements for a Drama degree as put forth by the American Theatre Association and enables the diligent student to prepare for the Graduate Placement Examination in Theatre.

Special Programs

See American Sign Language, Boston Lyric Opera, Division of Fine Arts, Humanities Center, Independent Major, Irish Studies, Tennessee Williams Review, and International Co-op.

Music

Joshua R. Jacobson, D.M.A., *Chairman*

Professors

Roland L. Nadeau, M.M.
Herbert H. Silverman, Ed.D.
Leo Snyder, M.M.

Associate Professors

Reginald Haché, A.D.
David Sonnenschein, D.M.A.

Assistant Professors

Julia A. Griffin, Ph.D.
Matthew McGarrell, M.M.
Dennis H. Miller, D.M.A.

Instructor

Linda C. Ott, M.M.

Lecturers

Edmond J. Moussally, M.M.
Karen L. Pokross, Ed.M.

Professional Preparation



Aims The Department of Music offers a comprehensive number of courses for students with an interest in, or a desire to learn about, music. In addition, the Department also serves the musical and cultural needs of the University and its various colleges, providing a wide range of musical experiences for students and the University community, and emphasizing the aesthetic aspects of intelligent listening to, and learning about, our musical heritage.

Department of Music courses fall within several categories: basic music theory, music education, historical periods and national styles, individual composers and their music, the forms of music, basic appreciation (overview), and functional performance.

In addition, faculty direct student performance organizations, such as the Early Music Players, the N.U. Choral Society, the N.U. Symphony Orchestra, and the N.U. Bands.

Students from these performance groups, as well as the music faculty and artists from the community at large, participate in a program of more than sixty concerts each year, most of which are free and open to the public.

The Bachelor of Arts degree program in Music Literature offers a broadly based general curriculum that allows students to do scholarly work in music. Students who select this major have the opportunity to prepare themselves for a wide variety of professions as well as for more advanced graduate study in the fields of musicology, music theory and composition, education, law, journalism, communication (radio and television), library science, and history.

In addition to the major program in Music Literature, the Music Department has established a minor program in music for degree candidates in the College of Arts and Sciences. The minor program allows students to complement their academic program by specializing in a second area of interest.

Special Programs

See Boston Lyric Opera, Concert Arts Orchestra of Boston, Division of Fine Arts, Humanities Center, Independent Major, League of Composers—International Society for Contemporary Music, and International Co-op.

Humanities

The Humanities are those disciplines concerned with human beings and their cultures—especially subjective aspects of cultures, which invest life with meaning and value. Examples are the disciplines of languages and literature, and philosophy and religion.

The Humanities are distinguished from the Social Sciences, which tend to focus on objective aspects of societies and of individual relationships in, and to, society. This distinction, however, is helpful only if used with reservations. Most humanistic disciplines do not neatly conform to one simple description or the other.

In the broadest terms, of course, the Humanities can be viewed as encompassing the Fine Arts. This is because a sense of aesthetics is among the most basic of human values. As a result, all cultures are centrally concerned with issues of form and beauty.

In the College of Arts and Sciences, the major disciplines comprising the Humanities division are as follows:

English	page 47
Journalism	page 49
Linguistics	page 50
Modern Languages	page 53
Philosophy and Religion	page 55
Speech Communication	page 57

English

Kinley E. Roby, Ph.D., *Professor and Chairperson*



Professors

Samuel J. Bernstein, Ph.D.
Robert J. Blanch, Ph.D.
Earl N. Harbert, Ph.D.
Victor E. Howes, Ph.D.
M. X. Lesser, Ph.D.
Samuel F. Morse, Ph.D.
James E. Nagel, Ph.D.
Jane A. Nelson, Ph.D.
Herbert L. Sussman, Ph.D.
Arthur J. Weitzman, Ph.D.
Paul C. Wermuth, Ph.D.

Associate Professors

Francis C. Blessington, Ph.D.
Timothy R. Donovan, Ph.D.
Irene Fairley, Ph.D.
Daniel Golden, Ph.D.
Gary Goshgarian, Ph.D.
Gerald R. Griffin, Ph.D.
Ruth K. MacDonald, Ph.D.
Stuart S. Peterfreund, Ph.D.
Guy Rotella, Ph.D.
Lloyd A. Skiffington, Ph.D.
Joseph E. Westlund, Ph.D.

Assistant Professors

Richard Bullock, Ph.D.
Michael Goodman, Ph.D.
Helen Loeb, Ph.D.
Janet Randall, Ph.D.

Lecturers

Joseph deRoche, M.F.A.
David Tutein, M.A.

Continuing Lecturers

Faye Firnhaber, M.A.
Maureen Godino, M.A.
Susan Goldwitz, M.A.
Eleanor Holstein, M.A.
Robin McCormack, M.A.
Eric Solomon, M.A.

Instructors

Jeffrey Berry, M.A.
Mary Blitzer, M.A.
Arthur Casciato, M.A.
Patricia Emlet, M.A.
Richard Finkelstein, M.A.
Wendy Goldberg, M.A.
Peter Martin Johnson, M.A.
Margaret Nichols, M.A.
Ellen Tucker, M.A.

ABD Lecturer

John Ralston Haynes, M.A.
Michele Souda, M.A.

Professional Preparation

Aims The English Department curriculum is diverse in its aims and flexible in its design. For the general University community, the curriculum offers possibilities in creative, expository, and technical writing; linguistics; and American, British, and foreign literature. For the preprofessional student—in law, medicine, business, or engineering—it offers a broad intellectual and cultural frame for specialist concerns. For the minor in English, it offers the possibility of concentration in literature, writing, or technical writing to supplement the major concerns of other disciplines. For the major in English, it offers the opportunity to prepare for careers in teaching and research, advertising and publishing, radio and television—indeed, any field in which communication and judgment go hand in hand.

At a time when the price of imprecision in language is more than simple misunderstanding, and the cost of changing values more than personal uncertainty, the study of literature provides “a momentary stay against confusion.” It deals with the hard edge of being, an insight into the ways of men and women, at once clear and complex. In fact, the very structure of literature gives shape and meaning to the often formless experiences of life. And it does so with grace and force. Put another way, literature “tells it like it is,” not statistically, not abstractly, but with

the details of fully realized people in accessible worlds, in "imaginary gardens with real toads in them."

Description of the Major There is flexibility enough in the curriculum requirements and its details to accommodate the pace and interest of a wide range of students. Members of the Department are available throughout the year to help and advise students, but the critical choices rest essentially with the student. The American literature requirement, for example, may be met by successfully completing courses from among such recent offerings as Major American Novels, The New England Renaissance, American Realism, and American Romanticism. To this area, as to others, the Department regularly adds new courses and, hence, even more options.

A View of the Major The curriculum for the major in English allows the student to take a wide variety of courses while maintaining a strong background in the history of British and American literature. After completing the freshman requirement, the English major takes survey courses, area courses (in language or writing, British literature, American literature, major figure, genre), other electives, and, finally, a Junior-Senior Seminar as the culmination of study. A student has the opportunity to study science fiction, Kurt Vonnegut, topics in film, or children's literature, as well as Shakespeare, early American literature, Romantic poetry, and topics in literary criticism. In an effort to be responsive to the individual interests and academic needs of a particular student, independent study also may be arranged with an English instructor.

A View of the Minor Students who would like to minor in English may choose the minor in literature, in expository and creative writing, or in technical writing. Within each minor, the student may select an individual course of study with the help of an English Department adviser. In the minor in writing, for example, the student may focus on creative, expository, or technical writing.

Special Programs

See American Sign Language, Humanities Center, Independent Major, Irish Studies, Linguistics Minor, Media Services Minor, Romanticism Past and Present, Studies in American Fiction, Tennessee Williams Review, and International Co-op.

Journalism

LaRue W. Gilleland, M.A.J., *Professor and Chairman*

Associate Professor

William Kirtz, M.S.

Assistant Professors

Jane Bick, M.A.

Patricia Hastings, Ph.D.

William James Willis, Ph.D.

Lecturer

Louis E. Conrad, M.A.

Professional Preparation



Aims Society relies increasingly on the mass media to keep abreast of rapidly changing conditions. It is the role of the journalist to observe, report, analyze, and interpret, as well as provide leadership through the media's many outlets.

Career Opportunities Many opportunities exist in the broad field of journalism and mass communications. Most Northeastern University journalism graduates work for daily and weekly newspapers, news departments of radio and television stations, wire services, general and specialized magazines, public relations departments, and advertising agencies. Also, Northeastern graduates have found that a journalism education offers an excellent background for many nonmedia fields where the communication process is important.

A View of the Major A journalist should have a broad background of liberal arts courses on the undergraduate level, a need that most university journalism programs have long recognized. The student should have professional courses but not to the point of overspecialization.

The generally accepted formula for the bachelor's degree in journalism is a combination of 75 percent arts and sciences courses and 25 percent professional courses. The ideal schedule is one or two journalism courses each quarter, with additional work in the humanities, social sciences, physical sciences, economics, and business.

Because journalism skills can be better expanded and understood with the aid of a laboratory, upperclass journalism majors are encouraged to participate in the Cooperative Plan of Education. Co-op assignments with newspapers, radio and television stations, news bureaus, advertising agencies, and public relations offices provide a laboratory experience important in offering students the opportunity to prepare themselves for careers in mass communications. In addition, such experience offers the student an advantage if he or she decides to seek admission to a graduate program in journalism.

All majors in this department complete a journalism core program that includes History of Journalism, Journalism Ethics, Newswriting, Editing, Law of the Press, and Photojournalism. In addition, each major takes courses in one of four concentrations—Newspaper/Print Media, Radio-Television News, Advertising, or Public Relations—according to his or her career objective.

Special Programs

See Center for Asian Studies, American Sign Language, British Government Studies, Independent Major, Media Services Minor, Russian Studies, Institute for Sport and Social Issues, Urban Studies Minor, Women's Studies Minor, and International Co-op.

Linguistics

An interdepartmental major

François Grosjean, Ph.D. and Doctorat d'Etat, *Assistant Professor and Coordinator, Psychology*

Professor

Harlan Lane, Ph.D. and Doctorat d'Etat, *Psychology*

Associate Professors

Irene Fairley, Ph.D., *English*

François Grosjean, Ph.D. and Doc. ès Lettres, *Psychology*

Michael Lipton, Ph.D., *Philosophy and Religion*

Joanne Miller, Ph.D., *Psychology*

Assistant Professors

Paul Dredge, Ph.D., *Sociology/Anthropology*

Ross Hall, Ph.D., *Modern Languages*

Janet Randall, Ph.D., *English*

Judy Shepard-Kegl, M.A., *Psychology*

Professional Preparation

Aims Linguistics is concerned with every aspect of language: for instance, how children learn to speak, how we understand and produce language, how language barriers keep people apart and how language ties bring them together, how language is structured and how it is represented in the brain, why some people are better at acquiring a second language than others, and how sign languages are different from spoken languages. Combined with other appropriate courses, a major in linguistics may be a useful first step in becoming, for instance, a linguist, an expert on child language, a teacher of a foreign language or of English as a second language, an interpreter, or even an expert in artificial intelligence. But above all, specializing in linguistics allows the student an opportunity to have an insight into language itself—a highly complex aspect of our everyday life that we take for granted far too readily.

Description of the Major The major in linguistics is an interdepartmental enterprise. Five departments (English, Modern Languages, Philosophy and Religion, Psychology, and Sociology/Anthropology) collaborate to offer a comprehensive program that makes use of the vast resources and talent that exist at Northeastern University in the field of linguistics. The major reflects the current research of such diverse people as linguists, sociologists, psychologists, language educators, and teachers of second languages. It is administered by a coordinator who is a member of the Psychology Department.

The major offers students a systematic introduction to modern linguistics and is broad enough to meet the needs of students interested in:

- general linguistics (phonetics and phonology, semantics, syntax, bilingualism, historical linguistics, philosophy of language, language and culture, American Sign Language);
- experimental linguistics (language and cognition, child language, neurolinguistics, psycholinguistics); and
- linguistics applied to language-related work (language teaching, language testing, language teaching materials, interpreting, literary analysis).

A View of the Major Students enrolled in the major can obtain either a Bachelor of Arts or a Bachelor of Science degree. These two degrees are in every way identical except that the second language requirement can be met with American Sign Language in the B.S. degree but not in the B.A. degree.

Besides the general college requirements, the requirements of the major include six basic courses from the main areas of linguistics: general linguistics, psycholinguistics, sociolinguistics, and applied linguistics. Students also take five additional courses in the area of their choice. These courses include, among others, Bilingualism, Child Language, Philosophy of Language, Linguistics of American Sign Language, Neurolinguistics, Transformational Grammar, Body Language, Animal Communication, Introduction to Semantics, and Symbolic Logic.

All students also take a laboratory course in which they are introduced to language research in a laboratory environment. Two advanced seminars are required as is a practicum that can take the form of fieldwork, interpreting, language teaching, or a directed study. The practicum is supervised by a faculty member who advises the student and monitors his/her progress. Advanced knowledge of a second language—spoken or sign—is required, by either taking appropriate courses or demonstrating proficiency in that language.

Combined with other appropriate courses, the program is suitable for those students interested in teaching American Sign Language. They may wish to concentrate on the applied linguistics of sign language while working on their bachelor's degree. This concentration enables students to acquire the background and the skills necessary to become professional teachers of sign language, and helps them prepare for the sign language instructor certification.

Throughout the course of study, students meet regularly with an adviser who helps them plan their course work and advises them on all aspects of the major.

Research The students enrolled in a directed-study course and in the laboratory course will take advantage of the Psychology Department's two language laboratories, which contain audio and video recording facilities and a computer for stimulus preparation, data gathering, and statistical analysis. They will work with graduate students, research assistants, and faculty on ongoing projects related to the perception and production of spoken and sign languages.

A brochure describing the linguistics major, as well as additional information, can be obtained from Professors F. Grosjean or J. Shepard-Kegl, Department of Psychology, 282 Nightingale Hall.

Description of the Minor In addition to the major, the linguistics program offers students specializing in other disciplines a minor in linguistics. This minor is designed to give students the opportunity to broaden their field of study and to enhance their career opportunities. The minor consists of eight courses, three required courses with the remainder selected from a large set of courses offered by the program. Students minoring in linguistics are assigned a faculty adviser to help them select the courses that best suit their needs.

A brochure describing the linguistics minor, as well as additional information, can be obtained from Professors F. Grosjean or J. Shepard-Kegl, Department of Psychology, 282 Nightingale Hall.

Special Programs

See American Sign Language, Intensive Summer Chinese Language Study, English Minor, Psychology Minor, and International Co-op.

Modern Languages

Holbrook C. Robinson, Ph.D., *Associate Professor and Chairman*
Israel A. Aluf, Ph.D., *Associate Professor and Executive Officer*

Professor

Samuel Jaramillo, Ph.D.

Associate Professors

Lillian Bulwa, Ph.D.
Benedetto Fabrizi, D.M.L.
Juliette M. Gilman, Ph.D.
Bonnie S. McSorley, Ph.D.
Constance H. Rose, Ph.D.
Philip H. Stephan, Ph.D.

Assistant Professors

Walter M. Gershuny, Ph.D.
Ross D. Hall, Ph.D.
Robert B. Modee, M.A.
Stephen A. Sadow, Ph.D.
John Spiegel, M.A.
Mary-Anne Vetterling, Ph.D.

Instructor

Daniel C. Barker, M.A.

Professional Preparation

Aims The study of Modern Languages can be of value to all students, regardless of their major fields of interest. In the complex and rapid pace of modern life, there is a need for increased communication between varied and often divergent cultures, even those within the narrow confines of one's own community. To better understand and appreciate these cultures, it is very important to know the ways in which the members of the culture think.

As the principal means of communication, language frequently offers the key to understanding. Thus, language may serve to help one achieve a more cosmopolitan, open-minded, and sensitive view of the world.

The Department offers opportunities for background preparation for students interested in elementary, secondary school, or college teaching; international business relations; government service; journalism; library science; world affairs; travel; and community service (especially in Spanish-speaking areas). Those who wish to teach in college must plan on graduate study.

Description of the Major Available in French, German, Italian, Russian, or Spanish, the major in Modern Languages normally requires advanced courses in two languages. The freshman year usually is considered a year to establish the basic foundation upon which the major will be formed. It should be utilized to fulfill as many general requirements as possible so that during the upperclass years more time can be devoted to the major discipline.

Normally the study of a second (minor) language begins in the second year. However, in exceptional cases, this pattern may be altered to permit students to begin their second language in the freshman year or, perhaps, postpone it to a later year. The Modern Language major should plan to take at least two language electives per quarter from the beginning of the second year. Again, of course, this pattern may be varied to fit the needs of the individual student.

It should be noted that the requirements indicated here for the major and minor languages are *minimum* requirements. When at all possible, a student is strongly encouraged to go beyond them, and even, perhaps, to pursue a third language.

The Department is currently designing a one-language major. Students are urged to consult their departmental advisers for further information concerning this program and other possible curriculum changes.

A View of the Major The Department offers a choice of either a Bachelor of Arts or a Bachelor of Science degree. For either degree, the student must select a major as well as a minor language from French, German, Italian, Russian, or Spanish. Both degrees require Freshman English.

The B.A. is, of course, the traditional degree of this discipline. Candidates for the B.A. must satisfy the College requirements for graduation and, in addition, must meet the departmental requirements in their major. These requirements are eight quarter hours in Western Civilization, eight additional quarter hours in history (any other history courses relevant to the major are acceptable), eight quarter hours of Survey of English Literature, a minimum of thirty-two quarter hours of advanced work in the major language, and eight quarter hours of advanced work in the minor language. Advanced work may be defined as any course beyond the intermediate level of the language.

The Bachelor of Science degree in Modern Languages differs from the B.A. primarily in its emphasis. Whereas the B.A. requires that the student satisfy the full general requirements of the College of Arts and Sciences, the B.S. waives certain of these requirements in favor of a more concentrated program in the major area.

In addition, the candidate for the B.S. degree must complete eight quarter hours of composition and conversation in the major language and eight quarter hours of composition and conversation in the minor language. Candidates then must complete forty additional quarter hours of advanced work in the major language and sixteen additional quarter credits of advanced work in the minor.

Since the Department is currently designing a one-language major, students are urged to consult their departmental advisers for further information concerning this program and other possible curriculum changes.

Description of the Minor For students interested in acquiring proficiency in one foreign language as an adjunct to their major, the Department offers a minor in Modern Languages, open to students of all colleges. The details of the requirements for a minor vary slightly from language to language, but, in all cases, the student is required to take a total of six courses. Generally, two composition and conversation courses, a civilization course, and an introductory course in literature are required. The remaining courses are free electives drawn from advanced courses offered by the Department.

Students are urged to consult the Department adviser for further information about the minor.

Additional Information In the basic language courses, attendance in the language laboratory is required for two half-hour sessions per week. The facilities of the language laboratory are also available on an optional basis for advanced work. The Department lounge is available to Modern Language students. See page 95 for information on courses in American Sign Language.

Special Programs

See Center for Asian Studies, American Sign Language, Intensive Summer Chinese Language Study, French for Business and Economics, Business German, Humanities Center, Independent Major, International Co-op, Irish Studies, Russian Studies, and Elementary Spanish for Criminal Justice and Human Services.

Philosophy and Religion

Michael R. Lipton, Ph.D., *Associate Professor and Chairman*

Professors

Walter L. Fogg, Ph.D.
Pavel Kovaly, Ph.D., C.Sc.

Assistant Professor

Susan M. Setta, Ph.D.

Associate Professors

William J. DeAngelis, Ph.D.
Bart K. Gruzalski, Ph.D.
Edward A. Hacker, Ph.D.
Stephen L. Nathanson, Ph.D.
Gordon E. Pruett, Ph.D.
Joseph H. Wellbank, Ph.D.

Professional Preparation

Aims Philosophy deals with a wide range of questions and issues generated by various aspects of human experience, by the beliefs and theories people hold, and by the practical problems human beings confront. Philosophy includes both questions and theories related to art, religion, morality, society, and natural and social sciences. Because of the breadth of its concerns, the study of philosophy provides a unique opportunity for students to examine their beliefs in many areas through critical reflection.

Through readings, discussion, and writing, philosophy students can encounter and examine questions concerning the nature and validity of religious beliefs, moral judgments, and scientific theories, as well as questions of values and social policy in such areas as law, medicine, and technology. In all these areas, analysis of issues and evaluation of arguments provide an opportunity to understand diverse claims to knowledge and areas of controversy.

The program includes courses that may help strengthen the student's work in other areas and provide an understanding of the methods and traditions of philosophical and religious thought. A major in Philosophy may also help a student to acquire a broad background in the humanities and to sharpen his or her critical abilities in preparation for graduate or professional study in many areas. Indeed, former Philosophy majors can be found in the most diverse of professional careers. For students majoring in another discipline, the Department offers a minor program, which can be a valuable supplement to most fields.

The program in Religion offers students the opportunity to acquire an understanding of religious experience, both as an individual response and within its social, historical, literary, and political context. Specific religions (Christian, Jewish, Hindu, etc.) are studied as well as the mythical and mystical dimensions of religious experience in general. The program strives to clarify the relation between the religious experience and other facets of human life that are the concern of both the liberal arts and the professions. Although a major is not offered in Religion, the program attempts to provide a basic introduction to religious studies. Both introductory and intermediate-level courses are offered.

Description of the Major Northeastern's program for a Philosophy major is designed to offer students a balanced understanding of the nature of philosophy and particular philosophical problems that arise in the various arts and sciences. A maximum number of electives has been provided so that students may choose in accordance with their own backgrounds and interests. Students may pursue either a five-year co-operative or a four-year full-time course of study.

All degree candidates in Philosophy must take at least eight quarter hours in English and fifty-two quarter hours in the Department and must meet the following specific requirements:

1. Classical Greek Philosophy *and* Modern Philosophy
2. Introduction to Logic *or* Symbolic Logic (the Department emphatically recommends that students contemplating graduate studies in Philosophy take Symbolic Logic)
3. Theory of Knowledge *or* Metaphysics *or* Moral Philosophy and
4. At least one seminar
5. Thirty-two quarter hours of Philosophy electives, to be selected after consultation with the student's departmental adviser

Description of the Minor To attempt to meet the needs of students who are majoring in other areas but have a special interest in Philosophy, the Department offers a minor in Philosophy. The program contains an essential core of courses, as well as a great range of electives to accommodate individual interests.

Specific requirements:

1. An introduction to philosophy course
2. Either Classical Greek Philosophy *or* Modern Philosophy
3. Either Introductory Logic *or* Symbolic Logic
4. Either Moral Philosophy *or* Theory of Knowledge *or* Metaphysics *or* Philosophy of Mind
5. Three electives in Philosophy to bring the total number of quarter hours in Philosophy to twenty-eight

Special Programs

See Center for Asian Studies, Humanities Center, Independent Major, Women's Studies Minor, and International Co-op.

Speech Communication

Carl W. Eastman, M.A., *Associate Professor and Chairman*

Associate Professor

Michael L. Woodnick, M.S.

Instructor

Andrea D. Mitnick, M.A.

Assistant Professors

Joan F. Drexelius, Ph.D.

Alan J. Zaremba, Ph.D.

Lecturers

Wesley Horner, B.M.

Joseph D. Warren, Ph.D.

Professional Preparation

Aims The Department of Speech Communication seeks to help stimulate the personal and professional growth of the student through a study of the principles and methods of communication.

Courses are designed to aid students in understanding the communication process and the roles of communication in society. The Speech Communication program also helps students to increase their self-awareness and heighten personal development by offering theoretical and experiential learning opportunities.

More than twenty-five courses in such areas as persuasion, group discussion and conference techniques, interpersonal communication, mass media, broadcasting, communication theory, and public address are designed to meet the needs of students, whether majoring or minoring in Speech Communication or selecting courses for personal development to supplement professional training in other fields.

Description of the Major The objectives of the Speech Communication major are threefold:

1. To stimulate the student's personal growth and development in perception and self-expression through the study of historical, contemporary, and artistic aspects of speech and communication, and to provide organized knowledge and critical insight;
2. To help to prepare the student for professions that require both a theoretical and a technical knowledge of communication, such as broadcasting, the law, government service, public relations, advertising, social service, industrial communication, and similar fields;
3. To help prepare the student for advanced graduate study in communication and other professional fields.

A View of the Major Students may receive either a B.A. or B.S. degree through concentrations related to mass communication, interpersonal communication, organizational communication, communication research, communication theory, advocacy, and public address. Through selection of the appropriate concentration within the Department and complementary elective courses in other departments, students are afforded considerable flexibility in tailoring their programs to satisfy their personal and professional needs.

To further provide for the unique needs of students with specialized interests or professional goals, the Department offers directed-study and internship programs. Virtually every Speech Communication major completes one or more projects in each of these programs.

In directed study, the student works closely with a chosen faculty adviser while completing a student-selected research or performance project. Generally commensurate with the workload of a one-quarter course, directed-study projects deal with such areas as surveying and interpreting communicative behavior, studies of the rhetoric of political campaigns, or the effects of the media on society.

The internship program offers students the opportunity for professional development through field experiences designed to complement or implement their classroom training. Distinct from the Co-op Plan, the internship program provides academic credit for unpaid, part-time, on-site activities, during the student's academic quarters, internships, carefully selected by the student and faculty advisers with an understanding based on the student's goals, often result in the student's placement in active roles in commercial broadcasting studios, advertising firms, and governmental agencies.

Description of the Minor Students majoring in such fields as Political Science, Business, and Human or Social Services for Education may develop a minor that complements their academic major by selecting appropriate courses with the aid of a Speech Communication faculty adviser.

Basic theoretical competence and personal skills in the areas of intra-personal, interpersonal, group, organizational, and public communication may be acquired by taking the following four core courses required of all minors: Introduction to Communication Theory, Business and Professional Speaking, Interpersonal Communication I, and Group Discussion.

Individual needs and specific goals may be satisfied by selecting three additional electives with the approval of the Speech Communication faculty. Recommended elective groupings have been developed for students concentrating in Management, Marketing, Elementary or Secondary Education, Human or Social Services, Political Science, Sociology, Psychology, and Journalism.

Special Programs

See American Sign Language, Center for Asian Studies, Humanities Center, Independent Major, and International Co-op.

Natural Sciences and Mathematics

The Natural Sciences are disciplines based chiefly on objective, quantitative hypotheses that can be confirmed or refuted by experimentation involving numerical measurements. These disciplines are sometimes referred to as the “exact sciences.” However, that may be somewhat misleading, since controlled approximations are more characteristic of them than exactness.

The older term used for the natural sciences (in the 17th and 18th centuries) was “natural philosophy.” This embraced the physical and life sciences as well as mathematics. The great treatise of Isaac Newton, which altered completely the understanding of the physical universe, was titled *Philosophiae naturalis principia mathematica* (Latin for Mathematical Principles of Natural Philosophy).

Although Mathematics is not confined to the study of nature as such—having more basic roots in subjective thought than in objective reality—it is nearly always grouped with the natural sciences. Indeed, mathematics is sometimes referred to as the “Queen and servant of the sciences.”

In the College of Arts and Sciences, the major disciplines comprising the Natural Sciences and Mathematics division are as follows:

- Biology page 60
- Chemistry page 63
- Earth Sciences page 67
- Mathematics page 68
- Physics page 70

Biology

David C. Wharton, Ph.D., *Professor and Chairman*

Professors

Francis D. Crisley, Ph.D.
Janis Z. Gabliks, Ph.D.
M. Patricia Morse, Ph.D.
Nathan W. Riser, Ph.D.
Fred A. Rosenberg, Ph.D.
Ernest Ruber, Ph.D.

Associate Professors

Kostia Bergman, Ph.D.
Charles H. Ellis, Jr., Ph.D.
Gwilym S. Jones, Ph.D.
Helen H. Lambert, Ph.D.
Charles A. M. Meszoely, Ph.D.
Joseph V. Pearincott, Ph.D.
Daniel C. Scheirer, Ph.D.
Phyllis R. Strauss, Ph.D.
Henry O. Wernitz, Ph.D.

Assistant Professors

Joseph L. Ayers, Ph.D.
Donald P. Cheney, Ph.D.
Richard L. Marsh, Ph.D.
Duncan R. Munro, Ph.D.
Michael D. Strauss, Ph.D.

Adjunct Professor

Bruce B. Collette, Ph.D.
Hillel Levinson, Ph.D.

Professional Preparation



Aims The Biology major offers students the opportunity to develop a fundamental background in the organization and the processes of life, from the level of molecules and cells through the level of organs and organ systems to the level of populations, species, ecosystems, and evolution. The major also offers the mathematical, chemical, and physical background necessary to understand biology and to help train students in practical scientific skills associated with each of these areas of study. Finally, it allows students to begin to specialize in a subdiscipline of biology.

Description of the Major The major consists of ten biology courses in addition to those required in chemistry, physics, and mathematics. Six of the biology courses constitute a required core sequence: Principles of Biology I, II, and III; Environmental and Population Biology; Genetics and Developmental Biology; and Cell Physiology and Biochemistry. A student normally should take the core before taking a required minimum of four upperclass biology electives. It is usually possible to follow the prescribed sequence if a student has decided on the major in the freshman or sophomore year. For students who may enter the major in the middler year, it is often possible to complete the major in the normal time by taking some of the electives concurrently with core requirements.

To graduate with a major in Biology, a student must have a cumulative Quality Point Average (QPA) of 2.000 for all science and mathematics courses required for the major. There are two programs within the Biology major, one leading to the Bachelor of Arts degree and the other to the Bachelor of Science degree. The B.A. program retains the College's language requirement; the B.S. program is more rigorous and extensive in its mathematics and science requirements and thus offers better preparation for postgraduate study. The difference is mainly one of emphasis, however.

After completing the core Biology program, students interested in independent research may arrange with individual faculty to undertake Directed Study; if eligible, they may be invited to undertake a more extensive Honors Program involving up to four quarters of research.

The Department publishes a booklet, *The Biology Undergraduate Advisory Guidebook*, which explains the required and recommended courses and the QPA standards in science for Biology majors. The *Guidebook* is available in the Biology Office, Room 403, Richards Hall. Students intending to major in Biology should obtain a copy as early as possible after their enrollment at Northeastern. Biology majors wishing to pursue a minor in another field should see their biology adviser as early in their program as possible, for coordination of major and minor requirements.

A View of the Major The Biology major provides an opportunity for excellent preparation in a wide variety of careers or professions in the life sciences, including medical, dental, and other health-related professions. Graduate study leading to a master's or doctoral degree can open careers in upper-level teaching and/or research in one of the specialized areas of biology, such as zoology, botany, microbiology, physiology, ecology, marine biology, cell biology, or biochemistry. Biology majors may also pursue postgraduate training in such health-related areas as nutrition, public health, or medical technology.

Biology majors not wishing to enter professional or graduate schools may find employment on technical levels in federal, state, industrial, hospital, or university laboratories doing research, survey, or quality control in a biological area. After graduation they may also be able to enter directly into positions in industries involved in the manufacture and distribution of pharmaceuticals, biological products, food, or scientific equipment. Many biologists are employed at all levels in fisheries, forestry services, county agencies, museums, aquariums, research vessels, and marine stations.

Preprofessional students (for example, premedical or predental) are urged to consult with the preprofessional advisory committee early in their careers at Northeastern. *Students are cautioned that the successful completion of the required preprofessional courses by no means ensures admission to a professional school since other factors are also involved.*

Description of the Minor A minor in Biology consists of any six 18.— courses for which the student has the prerequisites, plus two more courses which may be 18.— courses or courses from other departments that serve as prerequisites for Biology courses. At least five of the total eight courses must include laboratory, and a student may not count toward the Biology minor more than one course, or course sequence, that covers substantially the same material (examples of such duplication would be 18.114–115 and 18.116 and 18.143–144–148, or 18.111–113 and 18.131–133).

To accommodate the needs of students majoring in many different fields, the Biology minor requirements have been phrased in a very general and flexible way. To ensure that course selection is sound and appropriate to the student's background, *each student's Biology minor program must receive the signed approval of the Biology minors' adviser.* The student should obtain this required approval of his/her pro-

gram before the start or, at the latest, by the end of the first Biology course. Failure to do so may result in courses' not being counted for a minor, if the adviser finds them to have been inappropriate selections.

The academic standards for a minor in Biology are the same as those for a Biology major; namely, a QPA of 2.000 must be achieved for those courses used to satisfy the minor requirements. Courses taken on a pass/fail basis are not acceptable for minor credit.

Suggested course groupings for a Biology minor have been developed for students with different backgrounds in college mathematics and science. The "core" minor for students with considerable course work in mathematics, chemistry, or physics provides the basic foundation on which a Biology major is built, without advanced specialization. For students with less or no college mathematics/science background, three other minor options provide the opportunity for first-level exposure to the basic principles of Biology, plus an opportunity to achieve some advanced specialization in plant and/or animal studies or to explore human biology and the problems of the environment. For further information, consult with the Biology minors' adviser.

Laboratories

The Biology Department has specially equipped teaching laboratories for general biology, botany, anatomy, microbiology, microscopy, physiology, zoology, and cell biology. Equipment for field work, museum specimens, models, charts, and closed-circuit television are employed in laboratory instruction. Additional facilities include aquarium and animal rooms, stockrooms, preparation rooms, research areas, and a large suburban greenhouse and woodlot. The Department has close association with the University's Science and Maritime Studies Center in Nahant and with the University's Electron Microscopy Center.

Special Programs

See School of Field Studies, Independent Major, Instrumentation for Science Minor (see Physics Section), International Co-op, Marine Studies Minor, Combined Program with Pre-professional Schools and Sea-Quarter.

Chemistry

Philip W. Le Quesne, Ph.D., D.Sci., *Professor and Chairman*

Professors

Geoffrey Davies, Ph.D.
 Bill C. Giessen, Dr.Sc.Nat.
 Arthur M. Halpern, Ph.D.
 Barry L. Karger, Ph.D.
 John L. Neumeyer, Ph.D.
 Robert F. Raffauf, Ph.D.
 William M. Reiff, Ph.D.
 Robert A. Shepard, Ph.D.
 Alfred Viola, Ph.D.
 Karl Weiss, Ph.D.

Associate Professors

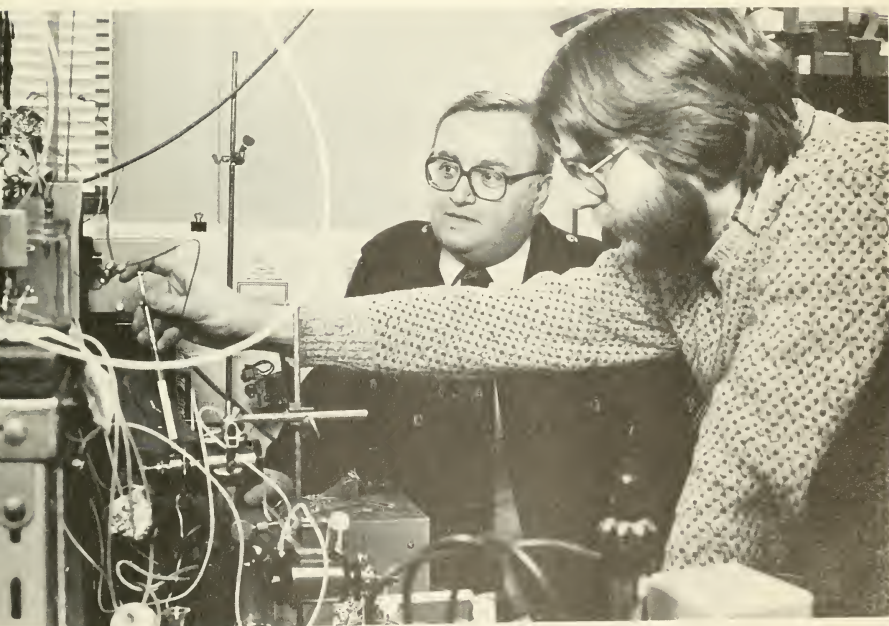
David A. Forsyth, Ph.D.
 David M. Howell, Ph.D.
 Conrad M. Jankowski, Ph.D.
 Elmer E. Jones, Ph.D.
 John L. Roebber, Ph.D.
 Paul Vouros, Ph.D.
 Robert N. Wiener, Ph.D.

Assistant Professors

Lee A. Flippin, Ph.D.
 Thomas R. Gilbert, Ph.D.
 Michael E. Kellman, Ph.D.
 Kay D. Onan, Ph.D.
 Mary J. Ondrechen, Ph.D.
 John Wronka, Ph.D.
 Lawrence D. Ziegler, Ph.D.

Instructors

James F. Hall, Jr., M.S.
 Bernard J. Lemire, B.S.
Supervisor of Laboratories



Professional Preparation

Aims The educational objectives of the Chemistry Department are to give students the opportunity to 1) experience the intellectual stimulation of studying a physical science, 2) grasp the basic principles and techniques that are central to a variety of chemistry-related careers, and 3) prepare for graduate study in chemistry or related fields. These objectives are implemented by the Department's highly research-oriented faculty, including leaders in various fields of the science.

Description of the Major Chemistry is concerned with the structure and properties of substances and with the transformations they undergo. The undergraduate program leads to either a B.A. or a B.S. degree in Chemistry. Our undergraduate chemistry major program is relatively small, having a combined total of about sixty undergraduates throughout all levels. Class sizes, too, are not large. For example, the typical size of the Freshman Chemistry course given to chemistry and other science majors is about forty students. The upper-class chemistry major courses are generally smaller. All of the courses are taught by full-time chemistry faculty members, and there is considerable opportunity for direct interaction between faculty and students. Both the chemistry curriculum and the departmental facilities are approved by the American Chemical Society (A.C.S.); thus, the B.S. degree which we award is A.C.S. certified and therefore carries national recognition for quality.

Modern chemistry is the cornerstone for a large number of professions and industries. Challenging career opportunities exist in almost all technical fields in which functions such as research, development, production, sales, market analysis, quality control, and management are involved. *The Chemistry major programs offer the students an excellent opportunity for preparation in the study of medicine, dentistry, and for advanced study in many fields of science.* For students who choose to participate in the Cooperative Plan of Education there can be additional professional benefits. The practical experience gained on a job places chemistry in a more realistic perspective than does academic training alone and may help students to prepare themselves for better employment prospects upon graduation.

The Department publishes an informational booklet, *Chemistry at Northeastern*, which describes the Chemistry major curriculum and requirements in detail. Interested students may obtain a copy of this booklet in the main office of the Chemistry Department, Room 102, Hurtig Hall or from the Department of Admissions, 150 Richards Hall.

A View of the Major The Department offers two major programs that lead to the B.S. or B.A. degree. Both are based normally on the five-year cooperative-study plan, but academically equivalent four-year study options are available. The two degree curricula differ mainly in their arts and sciences content and advanced science course requirements. Departmental advisers are ready to provide assistance and counseling to all Chemistry majors in relation to course selections and other professional matters.

The Chemistry major programs at Northeastern are based on a career-oriented concept. The basic core of courses in chemistry, mathematics, and physics may be supplemented with selected courses in other areas. Thus, the program offers the student an opportunity to prepare for any one of a wide variety of careers. Our alumni have pursued careers in many areas, such as:

- Technical employment in industry
- Chemical sales and management
- Teaching and research via graduate study
- Clinical chemistry, medicinal chemistry, and pharmaceutical chemistry
- Geochemistry, mineralogy, and environmental chemistry
- The health professions (medicine, dentistry)
- Forensic chemistry

Departmental advisers suggest various course options for students interested in preparing for any of the above careers. The variety of careers open to persons with strong backgrounds in chemistry is extensive, and other options can be constructed from the large number of courses offered at the University.

A large part of the curriculum is common to all options. It consists of courses in English, calculus, physics, and basic chemistry, which are taken in the freshman year. Students may be exempt from the General Chemistry courses by passing equivalency tests; in this case other courses are substituted. In the upperclass years, students take courses in organic, inorganic, physical, and analytical chemistry. For the B.S. degree, some additional advanced mathematics and science courses are required. German or Russian is strongly recommended for students who plan to pursue graduate study in the sciences.

Qualified students are encouraged to undertake a research project under the supervision of a faculty member. An honors program is open to especially able students.

Description of the Minor A minor program in Chemistry is available for students majoring in other fields. It consists of courses in general, analytical, organic, and physical chemistry. Further information may be obtained from the Chemistry Department Office, Room 102, Hurtig Hall.

Accreditation

The Chemistry programs at Northeastern are approved by the American Chemical Society. The B.S. degree meets the Society's requirements for certification, which means that a certified graduate is eligible for full membership in the A.C.S. after two years of experience.

Facilities and Research

The main facilities of the Chemistry Department are housed in Hurtig Hall, a modern, air-conditioned, five-story building that contains equipment for up-to-date teaching and research. All faculty offices are located there, as is the James Flack Norris Room, which serves as a lounge for undergraduate Chemistry majors. Additional research facilities are located in the Forsyth Building and in the Institute of Chemical Analysis, Applications, and Forensic Science. The Department's major research equipment includes electron microscopes, mass spectrometers, lasers, X-ray diffractometers, nuclear magnetic-resonance and electron spin-resonance spectrometers, Gouy and Faraday magnetic balances, Mossbauer spectrometers, and a variety of ultraviolet and infrared spectrometers. Undergraduate students taking advanced courses or working on research projects may utilize certain of these instruments.

Active research programs are under way in synthetic and mechanistic organic chemistry, natural products chemistry, inorganic chemistry, chemical oceanography, photochemistry, and spectroscopy, theoretical chemistry, analytical chemistry, separation science, and solid-state chemistry.

Special Programs

See Combined Program with Pre-professional Schools, School of Field Studies, Independent Major, International Co-op, Instrumentation for Science Minor (see Physics Section), Marine Studies Minor, and Sea-Quarter.



Earth Sciences

Richard H. Bailey, Ph.D., *Associate Professor and Chairman*

Associate Professors

Bernard L. Gordon, M.S.
Richard S. Naylor, Ph.D.
William A. Newman, Ph.D.
Peter S. Rosen, Ph.D.
David L. Wilmarth, Ph.D.

Assistant Professors

Malcolm D. Hill, Ph.D.
Martin E. Ross, Ph.D.

Professional Preparation

Aims The Department of Earth Sciences offers a degree program in geology as an in-depth study of a major area of the earth sciences, as well as courses in geology, oceanography, and astronomy, which are available to all students.

Description of the Geology Major Geology is a broad-based science that deals with the study of the physical features, composition, history, and processes of the earth. The study of geology, however, also demands an understanding of the application of scientific knowledge to current problems and concerns. For example, the manufacture of an enormous number of products composed of metals and petroleum derivatives is a primary basis of the economy of our society. Understanding the origins of these natural resources and the ways in which to ensure their continued supply is, therefore, one of the major roles of today's geologists. Only a small portion of the earth has been studied in detail, leaving many unexplored frontiers for each new graduate in the field.

A View of the Major Since the study of geology utilizes principles of other physical sciences, students should complete basic courses in chemistry, physics, and mathematics along with Physical and Historical Geology during their first two years. After completing the introductory geology courses and one year of chemistry, every Geology major takes a three-course sequence—Descriptive Mineralogy, Optical Crystallography, and Optical Mineralogy—since a knowledge of minerals is fundamental to geological understanding. In addition to the required introductory and mineralogy courses, the student chooses a minimum of six (for the B.A. degree) or eight (for the B.S. degree) additional geology courses. There are also electives required in the areas of the humanities and social sciences.

Each student is assigned to an adviser in the Department. The adviser assists students in making appropriate course selections as their knowledge increases and special interests develop. Though not required, courses in petrology, structural geology, and paleontology are usually among the electives chosen by undergraduates.

During the junior and senior years, students may select undergraduate research as one of their elective courses. Under the supervision of a faculty member, a problem is selected, defined, and researched. These projects offer undergraduates the opportunity to go much more deeply into some aspect of geology that holds particular interest for them. Students who meet the college requirements for the honors program may also be invited to help out an undergraduate research project.

In addition to its major curriculum the Earth Sciences Department also offers a minor program in Geology.

Special Information

Field Trips Though much geology can be learned from textbooks and in the laboratory, a sound geological education must also include first-hand experience in the field and direct observation of geological phenomena. Whenever it is appropriate, field work on an individual or group basis will be part of courses.

Special Programs

See School for Field Studies, Independent Major, International Co-op, Instrumentation for Science Minor (see Physics Section), Marine Studies Minor, and SeaQuarter.

Mathematics

Maurice E. Gilmore, Ph.D., *Professor and Chairman*

Professors

Samuel J. Blank, Ph.D.
 Bohumil Cenk, Sc.D.
 David I. Epstein, Ph.D.
 Holland C. Filgo, Ph.D.
 Alberto R. Galmarino, Ph.D.
 Arshag B. Hajian, Ph.D.
 Evelyn F. Keller, Ph.D.
 Nancy Kopell, Ph.D.
 Jayant Shah, Ph.D.
 Gabriel Stolzenberg, Ph.D.
 Jack Warga, Ph.D.

Associate Professors

Shirley A. Blackett, M.Ed.
 Mark Bridger, Ph.D.
 Gail Carpenter, Ph.D.
 Bruce Claflin, M.S.
 Ron Donagi, Ph.D.
 Ellen H. Dunlap, B.A.
 John Frampton, Ph.D.
 Samuel M. Giveen, M.A.
 Eugene Gover, Ph.D.
 Samuel Gutmann, Ph.D.
 Anthony Iarrobino, Ph.D.
 Nishan Krikorian, Ph.D.
 Richard Porter, Ph.D.
 Mark Ramras, Ph.D.
 Thomas O. Sherman, Ph.D.
 Victor R. Staknis, Ph.D.
 Chuu-Lian Terng, Ph.D.

Assistant Professors

Margaret Bayer, Ph.D.
 Robert W. Case, Ph.D.
 Mo-suk Chow, Ph.D.
 Margaret B. Cozzens, Ph.D.
 Dom P. deCaen, Ph.D.
 Stanley J. Eigen, Ph.D.
 Leonore Feigenbaum, Ph.D.
 Terence J. Gaffney, Ph.D.
 Laurence S. Gillick, Ph.D.
 Mark Goresky, Ph.D.
 Herwig Hauser, Ph.D.
 Solomon M. Jekel, Ph.D.
 Donald R. King, Ph.D.
 Zakhar G. Maymin, Ph.D.
 Robert C. McOwen, Ph.D.
 Carla B. Oblas, M.S.
 Prabhakar A. Rao, Ph.D.
 Catherine M. Roche, Ph.D.
 Martin Schwarz, Ph.D.
 Gordana G. Todorov, Ph.D.

Professional Preparation

Aims The Department offers interested students the opportunity to develop and expand their abilities in this exact science, one of the oldest and most basic of all the sciences.

Description of the Major The Department offers two programs of study in mathematics. One of the programs in mathematics leads to a Bachelor of Arts degree and requires a minimum of thirteen mathematics courses. Students in the Bachelor of Arts program also must complete a foreign language requirement. Because mathematics-related material is more often written in French, German, Italian, or Russian, one of these languages is recommended. The Department also offers a Bachelor of Science degree program, which requires a minimum of sixteen mathematics courses but does not require the study of a foreign language.

A View of the Major All students must take a basic sequence of mathematics courses, which, as a rule, should be completed by the end of the sophomore year. The sequence offers students the opportunity to acquire a working knowledge of the calculus of one and several variables, differential equations, some linear algebra, and numerical methods. With respect to the latter, although a computer programming course is not required, students will be encouraged and eventually expected to learn the basic programming skills necessary for numerical solutions of complex problems. Mathematical computer science courses are offered for interested first- and second-year students.

A transition from the basic sequence to more advanced parts of the curriculum is provided by Analysis I-II and Advanced Linear Algebra I. These courses are prerequisites for many advanced courses in applied analysis, complex analysis, topology, and foundations.

As a rule, students planning to take a substantial number of mathematics courses (e.g., two per quarter) should take Analysis I-II and Advanced Linear Algebra I in the middler year. Students may wish to take a prerequisite for more advanced courses in algebra and/or one that includes linear, nonlinear, and dynamic programming. Courses in probability, statistics, and numerical analysis may also be taken directly after the basic sequence.

Special Programs

See Independent Major, International Co-op, Instrumentation for Science Minor (see Physics Section), and SeaQuarter.

Physics

Robert P. Lowndes, Ph.D., *Professor and Chairman*

Professors

Ronald Aaron, Ph.D.
 Petros N. Argyres, Ph.D.
 Richard L. Arnowitt, Ph.D.
 Alan H. Cromer, Ph.D.
 William L. Faissler, Ph.D.
 Marvin H. Friedman, Ph.D.
 David A. Garelick, Ph.D.
 Marvin W. Gettner, Ph.D.
 Michael J. Glaubman, Ph.D.
 Hyman Goldberg, Ph.D.
 Walter Hauser, Ph.D.
 Giovanni Lanza, Ph.D.
 Bertram J. Malenka, Ph.D.
 Pran Nath, Ph.D.
 Clive H. Perry, Ph.D.
 Eugene J. Saletan, Ph.D.
 Carl A. Shiffman, Ph.D.
 Jeffrey B. Sokoloff, Ph.D.
 Yogendra N. Srivastava, Ph.D.
 Michael T. Vaughn, Ph.D.
 Eberhard von Goeler, Ph.D.
 Allan Widom, Ph.D.
 Fa Yueh Wu, Ph.D.

Associate Professors

Arun Bansil, Ph.D.
 Marie E. Machacek, Ph.D.
 Robert S. Markiewicz, Ph.D.

Assistant Professors

George O. Alverson, Ph.D.
 William N. Celmaster, Ph.D.
 John V. Chalupa, Ph.D.
 Ali H. Chamseddine, Ph.D.
 Robert A. Cordery, Ph.D.
 Ned S. Dixon, Ph.D.
 Linda S. Fritz, Ph.D.
 Velda Goldberg, Ph.D.
 Jorge V. José, Ph.D.
 Stephen McKnight, Ph.D.
 Mark Novotny, Ph.D.
 Rajendra Prasad, Ph.D.
 W. David Shambroom, Ph.D.

Professional Preparation

Aims Physics is concerned with the fundamental principles that govern natural phenomena, ranging in scale from collisions of subatomic particles, through the behavior of solids and liquids, to exploding stars and colliding galaxies.

Understanding these principles can help us unravel, explore, and predict the basic phenomena and processes of not only physics, but also of biology, chemistry, and the earth and space sciences. Such an understanding will also help with the creation, development, and operation of a broad spectrum of micro and macro devices ranging from the silicon chip electronic systems and lasers of today's high technology to the more conventional mechanical and electrical instruments and machinery of today's research and industrial organizations.

The educational objectives of the Physics undergraduate programs are to provide students with the opportunity to

1. experience the intellectual stimulation of studying science and, specifically, physics and astrophysics;
2. experience, by association, the excitement of the front-line research programs ongoing in the Department;
3. achieve an understanding of the basic principles and techniques that are central to the broad array of physics-related careers;
4. prepare for graduate study in physics or related fields.

To this end the Physics Department offers undergraduate courses at four levels:

1. descriptive courses intended primarily for nonscience majors with limited mathematical backgrounds;
2. general survey courses intended for students in scientific and engineering fields;
3. advanced courses focusing on particular areas of physics and intended mainly, but not exclusively, for Physics majors; and
4. highly advanced courses intended mainly, but not exclusively, for prospective graduate students in Physics.

Description of the Major Students who major in Physics are offered the opportunity to prepare for a wide variety of careers. In addition to work in industrial, government, and high-technology laboratories in areas of applied physics, students who have mastered the fundamental principles emphasized in a physics education may find opportunities in allied fields, such as biophysics, computer sciences, geophysics, medical and radiation physics, and various branches of engineering. Additionally, many students majoring in Physics go on to pursue advanced degrees in physics and related fields.

A student majoring in Physics may follow either a four-year full-time program or a five-year co-op program. The latter program allows students to alternate between the classroom and off-campus work experiences in research and professional organizations located not only in the important high-technology centers in and around Boston, but elsewhere in the United States. The co-op program enhances and complements the educational process, and helps provide financial assistance and the development of valuable career contacts with employers. In a number of cases, students in the Physics major work on co-op with a high-technology company, and then return to school and work with a related aspect of one of the research programs of the Department either for credit or as work-study.

A View of the Major Physics majors may study for either the Bachelor of Arts or Bachelor of Science degree.

Beyond the basic first- and second-year survey courses in physics and mathematics, B.A. candidates are required to pass three lecture and three laboratory courses in physics and one course in mathematics. The College requirements in English, modern language, and so forth must also be satisfied. This program is extremely flexible and allows the B.A. Physics major to pursue other interests in depth.

Candidates for the B.S. must pass seven lecture and three laboratory courses in physics, two advanced courses in mathematics, and five technical electives (courses in science or engineering) beyond the basic physics and mathematics courses. The B.S. program is most appropriate for those students who wish to pursue graduate study in Physics.

The first-year program for all Physics majors includes a three-quarter physics course common to all science and math majors and a three-quarter mathematics course. The remaining two courses each quarter can be chosen from a wide range of electives. Two-quarter courses in physics and mathematics and a physics laboratory course in Electronics and Data Analysis are required in the second year.

The upperclass lecture courses offered by the Department include Mechanics, Wave Motion and Optics, Thermodynamics, Electromagnetic Theory, Quantum Theory, Mathematical Physics, Nuclear Physics,

Solid State Physics, and Astrophysics. The upperclass laboratories include Wave Motion, Modern Physics, and Advanced Laboratory. These courses are taught by active researchers in physics who have a strong commitment to teaching, and the classes are generally small (ten to fifteen students).

There are special lectures sponsored by the Society of Physics Students and the Physics Club, as well as reading courses on special topics in physics.

Students interested in majoring in Physics should consult with one of the Department advisers as early as possible in their college careers to plan programs.

Description of the Minors The Physics Department offers two minor programs for students majoring in other fields: the Physics Minor and the Instrumentation for Science Minor.

The Physics Minor program is designed to accommodate a wide variety of interests while still providing a study of the fundamentals. To fulfill the requirements of this minor, a student must take five intermediate and/or advanced courses after completing introductory physics.

The Instrumentation for Science Minor is designed to provide a student with experience in the use of common laboratory instruments, the taking and the analysis of data, and elementary skills in electronics. A major goal of the minor is to prepare the student to design and construct relatively small scale special purpose measurement instrumentation. To fulfill the requirements of the minor a student must take four intermediate and/or advanced laboratory courses after completing introductory physics.

Further information on the Minor Programs may be obtained from the Physics Department Office, Room 112, Dana Research Center.

Honors Program and Undergraduate Research

Students invited into the Honors Program may take graduate courses, reading courses, and special topics courses in the various research fields of the Department. Such work occasionally leads to presentation of papers at professional meetings and to publication in professional journals.

Facilities and Research

The Physics Department is housed in the Dana Research Center, a modern, air-conditioned building which includes its own library, research laboratories, Department and student machine shops, electronics shop, conference and seminar rooms, and faculty and graduate and undergraduate student offices. The Department has its own computer facility, housing PDP 11/24 and LSI 11/23 computers dedicated to physics research programs. In addition, a Departmental terminal cluster providing access to three VAX 11/780 units of the University Computer Center is located in the Dana Center.

In addition to the research facilities on campus, faculty and graduate students currently pursue their research at a variety of off-campus national and international facilities: high-energy physics experiments at the Stanford Linear Accelerator Center (SLAC), Palo Alto, California, and at the Fermi National Accelerator Laboratory (Fermilab), Batavia, Illinois; high-magnetic field experiments at the National Magnet Laboratory, Cambridge, Massachusetts; inelastic neutron scattering experiments at the Brookhaven National Laboratory, New York, at the Oak Ridge Na-

tional Laboratory, Oak Ridge, Tennessee and at the Laue-Langevin Institute, Grenoble, France.

The Department's full-time faculty are involved in a broad spectrum of front-line experimental and theoretical programs in atomic and molecular physics, elementary particle physics, and solid state and low temperature physics. A full description of these programs may be obtained upon request to the Chairman of the Department.

Special Programs

See Independent Major, International Co-op, Marine Studies Minor, and SeaQuarter.

Social Sciences

The Social Sciences are disciplines involving the study of society as such, as well as the social behavior of individuals and groups. In contrast to the approach used in the Humanities, the Social Sciences tend to focus on objective aspects of societies. Measurement and testing, and the statistical treatment of data, play a larger role in the Social Sciences.

On the other hand, as mentioned before, this distinction is helpful only if used with caution. In the final analysis, human beings and human institutions cannot be studied without due attention to both subjective *and* objective factors. For this reason, the dividing line between Humanities and Social Sciences cannot be drawn sharply.

In the College of Arts and Sciences, the major disciplines comprising the Social Sciences are as follows:

- African-American Studies page 74
- Economics page 76
- History page 78
- Human Services* page 79
- Political Science page 81
- Psychology page 83
- Sociology and Anthropology page 86

* The Human Services major is offered jointly by the College of Arts and Sciences and the Boston-Bouvé College of Human Development Professions.

African-American Studies

An interdisciplinary program focusing on the black experience

Associate Professor

Holly M. Carter

Assistant Professor

Jordan Gebre-Medhin

Professional Preparation

Aims The African-American Studies Program at Northeastern University offers an interdisciplinary study of the black experience with two central purposes: 1) to provide academically rigorous and exciting courses for all students interested in the field, and 2) to contribute to the students' ability to develop research and analytical skills and to apply this learning, whatever their disciplines or career objectives.

By presenting fresh perspectives while remaining firmly grounded in traditional academic standards, the courses in the African-American Studies Program may aid the student in developing the skill of critical thinking. In addition, the curriculum is designed to present the student the opportunity to attain a facility with language. Both of these skills—sound thinking and effective use of language—are symbols of a meaningful liberal arts education and help to form a strong basis for professional or graduate work.



Description of the Major A major in African-American studies offers preparation for a wide range of professions, including education, law, medicine, and business.

Students majoring in the discipline may select an area of concentration from seven subject areas and work under the supervision of a faculty adviser.

Students from other disciplines should find that the courses in African-American Studies are designed to complement and enrich their chosen concentrations.

A View of the Major Courses in the discipline are organized under seven major subject areas: applied science, economics, education, history, humanities, political science, and sociology/psychology. Courses taken in the discipline may be credited toward degree requirements for all Arts and Sciences students.

African-American Studies majors may study for either the Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) degree. All majors are required to take the following subjects:

- Economic Issues in Minority Communities
- Directed Study for Senior Thesis
- Field Research Seminar for Seniors
- African-American Literature I
- Contemporary Issues in Black Society
- The Black Family
- African-American History I
- Research Seminar
- Public Policy Analysis
- Race Relations in America

Faculty advisers work with students to help them select electives within their chosen areas of concentration to fulfill their distribution and language requirements for the degree of Bachelor of Arts, or career package programs for the degree of Bachelor of Science.

Description of the Minor In an effort to meet the educational career needs of students who are majoring in other areas, but have special interests in African-American Studies, the Program offers a minor in African-American Studies. The minor consists of a core of three required courses, as indicated below, as well as courses selected from a broad range of electives and minor concentration clusters to accommodate individual needs. To qualify for a minor in African-American Studies, a student must successfully complete twenty-eight quarter hours in the field.

Required Courses

African-American Studies
Research Seminar
Race Relations in America

Special Programs

See Center for Asian Studies, Independent Major, International Co-op, Urban Studies Minor, and Women's Studies Minor.

Economics

Morris A. Horowitz, Ph.D., *Professor and Chairman*

Professors

Conrad P. Caligaris, Ph.D.
Harold M. Goldstein, Ph.D.
Daryl A. Hellman, Ph.D.
Irwin L. Herrnstadt, Ph.D.
Sungwoo Kim, Ph.D.
Gustav Schachter, Ph.D.

Associate Professors

Ernest M. DeCicco, Ph.D.
Pawan K. Sawhney, Ph.D.
Andrew M. Sum, M.A.
Gregory Wassall, Ph.D.

Assistant Professors

Neil O. Alper, Ph.D.
Bruce Bolnick, Ph.D.
Oscar Brookins, Ph.D.
Kamran N. Dadkhah, Ph.D.
Alan Dyer, Ph.D.
Barbara M. Fraumeni, Ph.D.
Jeanne K. Henn, Ph.D.
Steven A. Morrison, Ph.D.
Edward P. Shea, Ph.D.
James Wible, Ph.D.

Instructors

Maria N. DaCosta, M.A.
Meenakshi N. Dalal, M.A.
Herbert Eskot, M.A.
David Joulfaian, M.A.
Bruce L. Kutnick, M.A.
Nazma Latif, M.A.
James W. McKinsey, M.A.
Rajen Mookerjee, M.A.
Manijeh Sabi, M.A.
Prajapati Trivedi, M.S.

Professional Preparation

Aims The Economics program offers students the opportunity to obtain a better understanding of how our economy and other economies function, to prepare themselves for graduate study in economics, and to develop specialties that may qualify them to work as economists.

Description of the Major Economics is the study of ways in which scarce resources, including human resources, are deployed to satisfy the material wants of individuals and society. Economists analyze the factors that determine the success or failure of this process.

Macroeconomics, concerned with the overall economy, deals with such problems as inflation, unemployment, growth and instability, and government monetary, fiscal, and regulatory policies. Microeconomics is concerned with the economic behavior of individuals, households, firms, and industries. It assesses the economic effects of racism, sexism, pollution, and environmental damage and analyzes the economic aspects of natural resources, poverty, health, income distribution, trade unions, and collective bargaining.

Graduates may be employed by businesses in such activities as industrial relations, planning and forecasting, determining plant locations, and making financial studies. They may become expert in analyzing consumer demand and developing and marketing new products. They may conduct research, teach, or provide specialized consulting services. In addition, federal, state, local governments, and trade unions are important sources of jobs for economists.

A baccalaureate economics degree, or graduation with a number of advanced economics courses, offers students an excellent opportunity to prepare themselves for graduate programs in economics as well as for entry into schools of law and business.

A View of the Major There is considerable flexibility in the Economics program to enable students to concentrate in areas of personal interest. A student expecting to major in the field should take the problem-oriented Principles of Economics in the freshman or sophomore year to discover the range of insights economics can offer in analyzing and solving a variety of problems. Upper-division courses apply theory to an in-depth study of a specific area of the field.

Other courses for the major include two quarters each of fundamentals of mathematics, economic statistics, and economic theory. In addition, the Department offers electives in all areas of economics, honors courses, reading courses, and a senior seminar.

The courses listed above are required for either the Bachelor of Arts or Bachelor of Science degree. However, the B.A. follows the liberal arts tradition in its distribution and language requirements—the Department of Economics requires other social science courses as well, plus six economics electives. The B.S. is a professional degree. In addition to social science electives, it requires ten economics electives and one course in quantitative methods.

The Department courses offer training in economic theory, money and banking, public finance, international trade, growth and development, industrial organization, comparative economic systems, economic history, environmental economics, economics of crime, urban problems, labor markets, collective bargaining, human resources, poverty and discrimination, and medical economics. In addition, tool courses, such as statistics, mathematical economics, econometrics, and quantitative methods are available. Other electives and readings courses permit a student to study an area in-depth.

Description of the Minor The Department also offers a minor consisting of four required courses and four electives, which are selected in consultation with a faculty adviser. Any course taken outside the Department of Economics to satisfy these minor elective requirements must be approved by a faculty adviser in the Department.

Special Programs

See British Government Studies, Economic Planning and Policy M.S., French for Business and Economics, Business German, Independent Major, International Co-op, Irish Studies, Russian Studies, Trent Polytechnic Institute, and Urban Studies.

History

Raymond H. Robinson, Ph.D., *Professor and Chairman*

Professors

Philip N. Backstrom, Ph.D.
Ballard C. Campbell, Ph.D.
William M. Fowler, Jr., Ph.D.
Donald M. Jacobs, Ph.D.
John D. Post, Ph.D.

Assistant Professors

Laura L. Frader, Ph.D.
Ruth-Ann M. Harris, Ph.D.
Gerald H. Herman, M.A.
Martin R. Ring, Ph.D.

Associate Professors

Charmarie J. Blaisdell, Ph.D.
Norbert L. Fullington, Ph.D.
LaVerne J. Kuhnke, Ph.D.
Clay McShane, Ph.D.
Stanley R. Stembridge, Ph.D.

Professional Preparation

Aims History's concern with man in his diverse and complex past provides excellent opportunity for the development of greater understanding and appreciation of today's culture and civilization. Traditionally, history has been a major of great appeal to men and women desiring a broad base before they embark on careers in business, law, journalism, and government.

Other majors know that they want to work more directly in history. Some want to teach in public schools. They may elect education courses that may lead to the opportunity to obtain state certification. (Those desiring jobs in private secondary schools need not be certified by state authorities.) Teaching positions in colleges and universities require master's, and increasingly doctor's, degrees. An undergraduate major in History facilitates entrance to graduate programs in the field. Ordinarily, college and university history teachers spend part of their time in research and writing.

Not all professional historians teach and write. Many find pleasure and profit working in public archives, private historical societies, museums, and restoration projects. The careers serve not only other professional historians but a larger public as well.

Description of the Major For majors of such diverse interests and ambitions, curricula must combine sensible structure with flexibility. Majors in History at Northeastern may qualify for either a Bachelor of Arts or a Bachelor of Science degree. Since the B.A. requires a foreign language, it appeals to prospective candidates for graduate school where reading knowledge of foreign languages is often necessary; the B.S. is designed for students desiring greater specialization in history and a social science orientation.

Candidates for both degrees are required to take the surveys in Western Civilization and American History, and The Historian's Craft, which focuses on methods, problems, and philosophies of historians. Beyond the basic courses is a wide range of offerings covering the political, economic, social, and cultural history of man in diverse times and places.

A View of the Major To ensure a broad program of study, the College of Arts and Sciences requires that students choose courses offered by departments outside the area of the major: sixty quarter hours of history are required for the B.A. degree; seventy-two quarter hours for the B.S. degree.

The history requirements are broken into groups: Group A (Ancient, Medieval, and Early Modern Europe); Group B (Modern Europe); Group C (British North American Colonies and the United States); and Group D (Other Areas or Regions). A minimum of two courses (eight quarter hours) must be elected from each group.

Majors are also urged to avoid overspecialization at the undergraduate level. Though there are no maximum limits on the amount of history that may be taken, the Department advises broad course selection as the best policy for its majors. All majors are assigned to departmental advisers who offer counsel about the program. Students are urged to seek advice about history electives, about other electives, and about the honors program.

All qualified History majors are urged to consider the honors program in History. Those accepted write honors theses under the direction of members of the Department. Students ordinarily register the honors courses in their last three quarters of enrollment, except for the summer quarter when honors courses are not usually offered.

Description of the Minor Students interested in a minor in history should consult the History Department for information.

Special Programs

See Center for Asian Studies, British Government Studies, Intensive Summer Chinese Language Study, Independent Major, International Co-op, Irish Studies, New England Quarterly, Russian Studies, Institute of Sport and Social Issues, Trent Polytechnic Institute, Urban Studies, and Women's Studies.

Human Services

An interdisciplinary major involving the College of Arts and Sciences and the Boston-Bouvé College of Human Development Professions

Advisers

Eva Havas, Ph.D., *Sociology/Anthropology*

John D. Herzog, Ph.D., *Foundations of Education*

Wilfred E. Holton, Ph.D., *Sociology/Anthropology*

Ronald J. McAllister, Ph.D., *Sociology/Anthropology*

Harold S. Zamansky, Ph.D., *Psychology*

Fieldwork Supervisor

Natalie H. Riffin, M.Ed., O.T.R.

Professional Preparation

Aims This major offers students the opportunity to prepare themselves for possible careers in one of the areas broadly defined as "human services." The program is interdisciplinary. The Human Services curriculum allows students the opportunity to obtain fundamental attitudes, knowledge, and skills that may lead to meaningful careers in the helping professions as well as to graduate education in a variety of fields.

Students who major in Human Services through the College of Arts and Sciences may prepare themselves to perform a variety of functions in public and private agencies. Through course work, two quarters of fieldwork experience, and possible co-op jobs, students have the opportunity to explore such areas as casework services in social service and welfare agencies; therapeutic treatment programs in mental health settings; supportive counseling in community health centers; rehabilitation counseling services; sheltered workshops; parole counseling; court liaison in programs for delinquent youth; staff work in halfway houses, penal institutions, and drug treatment centers; supportive counseling for the mentally retarded; community organizing; services for the aging; administration in human services agencies; and social program research and evaluation.

Description of the Major The Human Services program offers a continuing advisory system to help students make the best use of their early course selections and to guide them to appropriate upper-level courses.

College Requirements. Degree requirements differ for each participating college. Refer to pages 38 to 39 for requirements in the College of Arts and Sciences and to page 107 for requirements in the Boston-Bouvé College of Human Development Professions. Students in Arts and Sciences may take a five-year Cooperative Education Program or a four-year full-time program.

There are five basic aspects to the program as follows:

1. **Prerequisite Courses.** Prescribed courses in sociology, psychology, government, economics, and human services are required, for a total of six courses.
2. **Core Courses.** Nine courses in such areas as statistics, research methods, group process, organizations, personality, intervention strategies, and a senior seminar are required as "core" courses.
3. **Specified Electives.** Three courses in the areas of Afro-American Studies, special education, and/or poverty must be selected from a list of recommended options.
4. **Specialization.** Each student must take a five-course specialization developed in conjunction with an adviser. Typically, these specializations are in one of three areas: administrative, community, and clinical. Specific course choices are designed to complement the individual's interests and goals.
5. **Fieldwork.** Human Services students are required to fulfill two fieldwork placements during the last two years of their program. Each placement consists of 150 hours on site. The type of placement varies according to the student's interest. In the past, students have found placements in community programs, nursing homes, vocational workshops, state and federal agencies, and recreational facilities. These experiences are supervised by University staff to maximize the student's learning opportunity.

A View of the Major The Human Services major offers students the opportunity to obtain useful values and basic knowledge relating to various human services fields. Courses introducing some basic skills can help them to understand and work with a variety of helping services.

Human Services students at Northeastern have been very active in their major and helpful to each other. The Human Services Student Organization combines social and career-related activities, which in the past have included open houses, day-long conferences, and weekend retreats. A quarterly *Human Services Newsletter* is published by students and faculty.

For specific details on degree requirements, students should consult their Human Services advisers or the Program Director in 212 Lake Hall, 437-2624.

Special Programs

See American Sign Language, British Government Studies, Independent Major, International Co-op, Personality and Social Psychology Concentration, Elementary Spanish for Criminal Justice and Human Services, Trent Polytechnic Institute, Urban Studies Minor, and Women's Studies Minor.

Political Science

Robert E. Gilbert, Ph.D., *Professor and Chairman*

Professors

Robert L. Cord, Ph.D.
David E. Schmitt, Ph.D.

Duane L. Grimes, M.A.
Margaret E. Leahy, Ph.D.
Bruce M. Logan, Ph.D.
Eileen L. McDonagh, Ph.D.
Donald J. Reaves, Ph.D.
Stewart Reiser, Ph.D.
David A. Rochefort, Ph.D.
Frank Schepps, Ph.D.

Associate Professors

L. Gerald Bursey, Ph.D.
Minton F. Goldman, Ph.D.
Suzanne Ogden, Ph.D.

Assistant Professors

Stephen F. Coleman, Ph.D.
Malcolm Cross, Ph.D.

Professional Preparation

Aims Political science is concerned with the study of political institutions, the social and economic forces that shape them, the cultural context within which they operate, and human behavior in political matters.

The Department of Political Science at Northeastern University has three objectives: (1) to offer students the opportunity to obtain an education within the framework of the best liberal arts tradition; (2) to help heighten students' awareness of political forces in the environment and to sharpen their perception of their role as citizens in a democratic society; and (3) to provide the opportunity for acquiring a solid academic foundation to those who elect political science, law, or public administration as a professional career.

Description of the Major The study of political science can be the gateway to a liberal education with its benefits of broadened interests, sharpened sensibilities, and a quickened sense of civic responsibility. If you have a special interest in public affairs, studies in this field can help you prepare for government service, the study of law, the teaching of government and related subjects, or a career in politics or public management.

For the student who wishes to pursue professional studies at the graduate level, concentration in Political Science and Public Administration may help lead to many attractive opportunities. As in many fields, competition for positions is keen, so the student's success will depend upon such factors as academic record, experience, and personal initiative. There are some career opportunities in public management at the federal, state, and local levels of government, while positions in research are often available in government and university research bureaus. Teaching offers further career possibilities, as do specialized agencies in international bodies like the United Nations, which call for the skills of the political scientist. Individuals with specialized training in political science can compete for positions in less obvious areas: in the public-service programming of educational and commercial television, in journalism, in legislative and lobbying work and in public relations activities with private associations.



A View of the Major Students may select either the Bachelor of Arts or the Bachelor of Science degree program. Students in the B.A. program have to meet foreign language and other requirements of the College. Both degree programs (B.A. and B.S.) require four quarter hours in each of the following: Introduction to Political Science, Introduction to American Government, Foreign Governments, International Relations, Public Administration, and Political Theory, as well as twenty-four to twenty-eight quarter hours of electives in political science and six electives (twenty-four quarter hours) in the social sciences, with at least one course in at least three of the following: African-American studies, anthropology, economics, history, psychology, or sociology. The B.S. student is required to take eight hours of research methods. Courses in basic math and FORTRAN and FORGO are also recommended for B.S. students.

Public Administration

The Bachelor of Science program with a concentration in Public Administration provides a third option for the student. This program requires the completion of forty hours of such courses as Introductory Political Science, American Government, Public Administration, Public Policy Analysis, Personnel Administration, Public Budgeting, Organizational Theory, and similar courses. Students must also complete at least sixteen quarter hours of Public Administration electives. In addition, they must complete twenty-four hours of electives in the social sciences, at least eight of which should be in economics. Interested students may undertake a directed-study project based on an internship experience in a government agency.

Description of the Minor A minor in Political Science is also available to interested students. It entails successfully completing seven political science courses, of which at least two must be from the following: Introduction to Politics, Introduction to American Government, Introduction to

International Relations, Introduction to Foreign Governments, or Public Administration.

Special Programs

See Center for Asian Studies, British Government Studies, Independent Major, International Co-op, Irish Studies, Russian Studies, Trent Polytechnic Institute, Urban Studies Minor, and Women's Studies Minor.

Psychology

Martin L. Block, Ph.D., *Associate Professor and Chairman*

Professors

John C. Armington, Ph.D.
Harlan L. Lane, Ph.D., Doc. ès
Lettres
Helen S. Mahut, Ph.D.
Bertram Scharf, Ph.D.
Murray Sidman, Ph.D.
Alexander A. Skavenski, Ph.D.
Michael Terman, Ph.D.
Harold S. Zamansky, Ph.D.

Associate Professors

Edward A. Arees, Ph.D.
Roger Brightbill, Ph.D.
Perrin S. Cohen, Ph.D.
François Grosjean, Ph.D., Doc.
ès Lettres
Stephen Harkins, Ph.D.
Charles Karis, Ph.D.
Harry Mackay, Ph.D.
Joanne Miller, Ph.D.

Assistant Professors

John Carroll, M.A.
Adam Reeves, Ph.D.
Judy Shepard-Kegl, M.A.

Clinical Associate Professor

Karen Geelen, Ph.D.

Adjunct Associate Professor

Lawrence Stoddard, Ph.D.

Professional Preparation

Aims Modern psychology may be broadly defined as a science that examines what people and other organisms do as well as how and why they behave as they do. Psychology is also an interdisciplinary science that depends heavily on the methods and much of the knowledge derived from the other sciences. With these considerations in mind, the undergraduate curriculum offers students the opportunity to develop a sound foundation in the scientific underpinnings of modern psychology to prepare them for a diversity of careers in teaching, research, public service and professional practice.

Description of the Major Our courses offer the opportunity to students for preparation to enter a variety of work settings in which in-service specialty training is ordinarily offered (e.g., community mental health centers, vocational rehabilitation offices, and correctional programs) or to enter advanced training in such graduate programs as psychology, life science, or any of the health professions and medical specialties.

The Psychology curriculum explores many topics, such as the function of the brain in determining behavior; how we see, hear, and learn; what

behavioral science can offer in the problem areas of mental retardation, personality problems, infancy, and old age; and how we might suggest social changes based on laboratory data to increase men's and women's accomplishments and satisfactions in the modern world. In addition the curriculum offers opportunities for laboratory practice and experimentation, field experiences in behavior technology, and small-group seminars to encourage critical and creative evaluation of psychology's accomplishments and its future.

A View of the Major The Department offers both a Bachelor of Arts and a Bachelor of Science degree. The B.S. degree is usually recommended for students with a strong scientific or professional interest who ultimately may consider applying to graduate schools in psychology or environmental science. In addition, the Department offers a special B.S. program for Psychology majors who wish to prepare for application to health professions schools. Since modern psychology is multidisciplinary, the B.A. and B.S. programs both include distribution requirements in allied sciences to fulfill the need for wide exposure to varying techniques of scientific practice and interpretation.

With the science courses and elementary psychology courses as foundations, students in the B.A. and B.S. programs may either pursue a general course of study in psychology or choose one of four major areas for concentration: Language and Cognition, Learning and Behavioral Analysis, Personality and Social, or Sensory and Neuropsychology. The curricula for the areas of concentration have been structured so that the student often takes courses not only in psychology, but also in related disciplines. For example, a student concentrating in Personality and Social takes courses in sociology, anthropology, and speech and drama. The student's final choice of concentration should be made only after personal consultation with his or her Psychology Department adviser.

Within each of the four concentrations, the student is expected to progress through a sequence of specialty courses, laboratory courses, and a seminar. The student is thus afforded the opportunity to explore a given area of psychology in depth, as well as to acquire an overview of the broader issues in psychology. Furthermore, all B.S. students and qualified B.A. students participate in the Department's Directed Studies Program, in which, under the direction of a faculty member, they engage in research projects in various laboratories in the Department. In this way, classroom learning is complemented by laboratory research, where the student may learn by doing.

Description of the Minor Each student is required to take at least eight psychology courses, including the introductory psychology sequence, intermediate specialty courses, and at least one laboratory course. The minor program itself is quite flexible, designed for students with a broad range of interests and career goals. Students may choose either to distribute the eight psychology courses over a broad range of areas or to focus on one of the four areas corresponding to the major concentrations: Language and Cognition, Learning and Behavior Modification, Personality and Social, and Sensory and Neuropsychology. Students are assigned faculty advisers in the Department to help them select the minor program that best suits their needs.

Topics in Psychology Series (TIPS)

As well as offering courses designed primarily for psychology majors, the Department also offers a variety of courses without prerequisites that are addressed to specific topics of broad current interest. Examples include Psychological Testing, Marriage and the Family, The Disordered Mind, Body Language, Sexual Behavior, Brain and Mind, Psychology and the Law, Animal Communication, Man in Isolation, Memory and Remembering, The Young Offender, and Behavior Problems and Their Therapies.

Research Laboratories

The student who enrolls in laboratory courses and directed-study courses will take advantage of the Department's resources for research, which include: (a) in the field of learning, behavior laboratories for research with humans, monkeys, rats, and pigeons; and, in collaboration with the Walter E. Fernald State School, an instructional setting for research and training in behavior modification with retarded children and adults; (b) in neuropsychology and ethology, primate and rodent surgeries in neuroanatomical and histological laboratories, with apparatus for stimulating and recording activities of the brain; (c) in the psychology of vision and hearing, specialized enclosures and equipment for presenting visual and auditory stimuli and for measuring responses of the eye and the ear, including on-line computers; (d) in language and cognition, audio and video recording facilities and a computer for control of stimulus and response variables; and (e) in the field of personality, dark-rooms, tachistoscopes, and an eye-movement camera.

Special Programs

See American Sign Language, Independent Major, International Co-op, Linguistics Minor, Personality and Social Psychology Concentration, Combined Program with Professional Schools, Institute of Sport and Social Issues, and Women's Studies Minor.

Sociology and Anthropology

Carol A. Owen, Ph.D., *Associate Professor and Chair*

Professors

Morris Freilich, Ph.D.
Elliott A. Krause, Ph.D.
Jack Levin, Ph.D.
Morton Rubin, Ph.D.
Earl Rubington, Ph.D.

Associate Professors

Richard Bourne, Ph.D.
M. Patricia Golden, Ph.D.
Wilfred E. Holton, Ph.D.
Debra R. Kaufman, Ph.D.
Lila Leibowitz, Ph.D.
Ronald J. McAllister, Ph.D.

Assistant Professors

Arnold Arluke, Ph.D.
Winifred Breines, Ph.D.
Paul C. Creelan, Ph.D.
C. Paul Dredge, Ph.D.
Eva C. Havas, Ph.D.
Maureen Kelleher, Ph.D.
Alan M. Klein, Ph.D.
Thomas H. Koenig, Ph.D.
Bruce K. MacMurray, Ph.D.
Judith Perrole, Ph.D.
Michael Rustad, Ph.D.
Thomas M. Shapiro, Ph.D.
Carmen J. Sirianni, Ph.D.

Professional Preparation

Aims The disciplines of sociology and anthropology apply a critical perspective to the study of social arrangements in which human beings live and die. Systematic research methods and theory are brought to bear on how societies function and change, and on how individuals, groups, and institutions interact. Applications are made to such areas as social policy, criminology, medical and mental health issues, and business issues.

Description of the Major A major in this Department offers background preparation and preprofessional training for a wide spectrum of careers in public or private service and research. Students may wish to pursue graduate study in Sociology, Anthropology, or Social Psychology.

Students may concentrate in sociology or anthropology or both. Students who wish to study both must design their own programs, with the help of an adviser. Those enrolled in premedical, prelegal, paramedical, or a variety of other preprofessional programs should find that sociology and anthropology courses can offer a useful background.

A View of the Major Majors may follow either a four-year full-time program or a five-year cooperative course of study. Cooperative work assignments vary from placement in mental hospitals and social agencies to placement in university, government, and other research and policy-making settings. Transfer between the five-year co-op program and the four-year full-time program is possible, and registration in either is not an irreversible decision.

The Department offers both a Bachelor of Arts and a Bachelor of Science degree. The requirements for each degree, both in sociology and in anthropology, are outlined below. A student with specific goals may, of course, take more departmental electives than are required. B.A. students may wish to look at the concentration requirements for B.S. students and consult their advisers for assistance in planning programs with specialized goals.

The Department offers a B.S. with concentrations in anthropology or sociology. Students selecting this option must fulfill all the major requirements set by the Department for the B.A. degree and must take a co-

herent program involving additional course work as outlined below. Specializations are interdisciplinary and involve more intensive study within a concentration.

Description of the Minor in Sociology In addition to the major program, the Department also offers students majoring in other disciplines the opportunity to take a minor in Sociology. The minor program consists of the following:

- A. 21.100 Introduction to Sociology
- B. Two courses from among
 - 21.240 Research Methods I
 - 21.241 Research Methods II
 - 21.280 Classical Social Thought
 - 21.281 Current Social Thought
- C. Any three-course specialization in sociology arranged between the student and the adviser.

Description of the Minor in Anthropology In addition to its major program, the Department also offers students majoring in other disciplines the opportunity to take a minor in Anthropology. The minor program consists of the following:

- A. 20.100 Introduction to Social Anthropology
- B. 20.130 Language and Culture
 - 20.135 Individual and Culture
 - 20.160 Sex, Sex Roles, and Family
- C. Any two-course specialization in Anthropology arranged between the student and adviser.

For other minors see Special Programs, page 94.

Anthropology

B.A. students in Anthropology must take at least forty-eight quarter hours in departmental courses, including forty in anthropology and eight in sociology. The exact distribution can be arranged. Minimum requirements are as follows:

- A. Preparatory—Introduction to Anthropology and Introduction to Sociology. (Prospective majors with equivalent background may be exempted. Students should consult a departmental adviser.)
- B. Core Requirements—at least three of the following, as available: Language and Culture; Individual and Culture; Human Origins; Anthropology of Religion; Sex, Sex Roles, and Family; and Archaeology.
- C. Electives—Students must take at least six additional electives in anthropology and at least one additional elective in sociology. Qualified students are encouraged to take relevant graduate courses with the consent of the instructor. Majors should freely consult their advisers since courses elsewhere in the University may round out a special interest or focus.
- D. Nondepartmental Requirements—Six courses from the following social sciences: African-American studies, economics, history, political science, and psychology.

B.S. students in Anthropology take the same basic core of courses and, in addition, an individually designed specialization in an area of

interest consisting of at least five courses. Students *must* confer with an adviser who will help develop such a program, place it on record, and supervise it. Interdepartmental and interdisciplinary specializations can be arranged in such areas as linguistics, Native American studies, biological anthropology, psychological anthropology, or area studies focusing on Latin America, Africa, Asia, or the Middle East.

Sociology

B.A. students in Sociology must take at least fifty-two quarter hours in departmental courses, including forty-four in sociology and eight in anthropology, and must meet the following minimum requirements:

- A. Preparatory—Introduction to Anthropology and Introduction to Sociology. (Prospective majors with equivalent background may be exempted. Students must check with the Department.)
- B. Core Requirements—Statistical Analysis; Research Methods I; Research Methods II; Classical Social Thought; Current Social Thought; Class, Power, and Social Change.
- C. Electives—The following are minimum requirements: two intermediate courses (at 100 level); two advanced courses (at 200 level); and one intermediate or advanced anthropology course. With the adviser's consent, qualified students are encouraged to take certain graduate and directed-study courses and/or the Senior Majors Seminar.
- D. Nondepartmental Requirements—Six courses from the following social sciences: African-American studies, economics, history, political science, and psychology.

B.S. students in sociology take the same basic core of courses and, in addition, an individually designed specialization in an area of interest consisting of at least six courses, some from within and some from offerings outside the Department. Students *must* confer with an adviser who will help develop such a program, place it on record, and supervise it. It is possible to arrange specializations focusing on social welfare, health services, political studies, urban studies, education and society, ethnic studies, and organizational studies. There are, of course, many other areas of specialization and possible combinations of courses. The following offer a few examples (courses in the Department of Sociology/Anthropology are indicated by an asterisk):

Social Welfare

- *Sociology of Poverty
- *Social Policy and Social Intervention
- *Sociology of Human Service Organization
- *Private and Public Assistance
- The Welfare System in America
- Income Inequalities and Discrimination
- Politics of Poverty

Health Services

- *Medical Sociology
- *Death and Dying
- *Health Care as a Social Issue
- *Culture and Mental Illness
- *Aging and Society
- *Sociology of Mental Health
- Medicine, Religion, and the Healer's Art

Medical Economics
Community Medicine and Health-Care Delivery
Human Services Administration

Urban Studies (Contact the College of Arts and Sciences for information on the Urban Studies interdisciplinary minor.)

- *Cities and Society
- *Community Analysis
- *Suburb and Metropolis
- *Seminar in Urban Studies
- Urban Politics
- Urban Economics
- The Economics of Urban Poverty
- American Urban History
- Architecture and the City

Law and Society

- *Crime, Conflict, and Justice
- *Sociological Theories of Crime
- *Social Policy and Social Intervention
- Civil Liberties
- Law and Society
- The Economics of Crime
- The Politics of the Criminal Justice System

Occupations and Professions

- *Occupations and Professions
- *Sociology of Work
- *Social Roles in the Business World
- *Medical Sociology
- Labor Market Economics
- History of the Professions

Sex Roles and Family

- *Sex, Sex Roles, and Family
- *Sociology of the Family
- *Kinship and Society
- *Sex-Gender Roles in a Changing Society
- *Violence in the Family
- Sex Roles in American Politics
- Women in Modern Europe
- The Black Family

Organizational Studies

- *Sociology of Business and Industry
- *Sociology of Work
- *Administration and Formal Organization
- *Social Policy and Social Intervention
- *Social Roles in the Business World
- *Human Services Organization
- Organization Theory
- People in Organizations

Deviance

- *Social Deviance
- *Drugs and Society
- *Sociology of Alcoholism

- *Juvenile Delinquency
- *Sociological Theories of Crime
- The Disordered Mind
- Abnormal Psychology I, II
- The Female Offender

Social Psychology

- *Social Psychology (Sociology, Psychology Departments)
- *Anthropology of Aggression
- *Group Behavior I, II
- *Seminar Soc. Psych.
- Personality
- Psychology Lab. Soc. Psych.
- Psychology Lab. Personality

Popular Culture and Mass Communication

- *Mass Communication and Public Opinion
- *Collective Behavior
- *Leisure, Sport, and Society
- *The Sociology of Everyday Life
- History of Media in America
- The Automobile in America
- Survey of African-American Music
- Popular Culture

**Departmental Course*

These are samples of approaches to particular areas; there are many other possible combinations of courses as well as many other areas of specialization.

Special Programs in the College of Arts and Sciences

Reflecting the awareness that ideas, fields of study, and interests do not always fall into traditional, neatly compartmentalized units, the College of Arts and Sciences makes a wide variety of special programs available to its students. Field-study programs, international work/study opportunities, interdisciplinary majors and minors, involvement with professionals—all are among the options available to students who meet the program eligibility requirements. Students who participate in these programs should find their educational experience at Northeastern greatly enhanced. Detailed information about these programs is available from involved departments and the Dean's Office.

Minors

The College of Arts and Sciences offers to all upperclass students in the College of Arts and Sciences, as well as in other colleges in the University several choices of minors. Below is a list of all those minors. Descriptions of those that are offered through one department are found in the section of this publication for that department; descriptions of interdisciplinary minors, those indicated with an asterisk, are found in this Special Programs section.

African-American Studies
 Anthropology
 Art
 Biology
 Chemistry
 Computer Science (offered through the Mathematics Department)
 Drama (with options in Performance, Technical Theatre Design, Drama Literature, and Criticism)
 Economics
 English (with options in Literature, Expository and Creative Writing, and Technical Writing)
 Geology
 History
 Instrumentation for Science
 Linguistics
 Marine Studies*
 Modern Language (with options in French, Spanish, German, Russian, and Italian)
 Media Services*
 Music
 Philosophy
 Physics
 Political Science
 Psychology (with options in General, Language and Cognition, Learning and Behavior Modification, Personality and Social, Sensory and Neuropsychology)
 Sociology
 Speech Communication
 Urban Studies*
 Women's Studies*

The Center for Asian Studies

The Center for Asian Studies was established to encourage, develop, and promote teaching and research on Asian life, and educational and cultural exchange of students and scholars. The Center develops and supports multidisciplinary academic programs, courses, and research that focus on individual Asian countries, the region as a whole, or specific issues applicable to Asian life, such as Asian political processes or family life in Japan. The Center's goal is to foster a deeper understanding of Asian societies and cultures through (1) support for scholarly research, faculty, and visiting scholars; (2) the development and teaching of graduate and undergraduate courses to develop academic and professional interest; and (3) the acquisition, publication, and dissemination of research findings on topics selected to advance scholarship and knowledge about Asia.

The Center also encourages and sponsors seminars, symposia, and conferences on related issues. The proposed Asian Studies Minor will draw together studies in the departments of Art, History, Modern Languages, Philosophy/Religion, Political Science, and Sociology/Anthropology. Course offerings include history, language, philosophy and religion, political science, sociology, and anthropology.

American Sign Language

Interpreter Training The Summer Program for the Training of Sign Language Interpreters is an intensive course for individuals who are already fluent or near fluent in American Sign Language. The content and format of the program provide an introduction to the theoretical and practical aspects of Sign Language Interpreting. Classroom sessions typically include lectures, discussions, and role plays that address some of the following issues: the parameters in the interpreter role, professionalism, the code of ethics, definitions, the client-interpreter relationship, interpreting in special settings, and linguistic and cultural considerations. Laboratory sessions provide opportunities for the student to translate American Sign Language to English and English to American Sign Language with constructive feedback. Students may have opportunities to observe interpreters and acquire supervised experience in American Sign Language use and interpretation.

The Interpreter Training program is also offered as a nonintensive sequence of courses throughout the academic year and may constitute a special focus of a major in linguistics.

Teacher Training Sign Language Teacher Training is offered as an intensive summer program for those with American Sign Language fluency, or as a program of courses which constitute the majority of courses in a linguistics major. The summer intensive training program is for individuals already proficient in the language who are currently teaching, or who would like to teach. Content areas include: history and structure of the language, deaf culture, curriculum for sign instruction, and methods and materials for sign language instruction. A short practicum experience in teaching American Sign Language in a mock classroom setting is accompanied by constructive feedback.

Northeastern University is the New England regional training site under the National Consortium of Programs for the Training of Sign Language Instructors. Sign Language Programs also provide assistance in curriculum design and staff training to ongoing sign language programs offered at other agencies or institutions. Trained members of the staff

are available for program consultation and workshop presentations designed both to help train current and prospective teachers of American Sign Language and to explore issues concerning interpreting and teaching.

Visiting Students Program The Psychology Department offers programs at both undergraduate and graduate levels for students who wish to visit the University and become involved in an intensive exposure to American Sign Language (ASL) linguistics. These students have the opportunity to take courses in linguistics and ASL. An important aspect of the program is the opportunity to participate in directed studies through which students may take part in ongoing ASL research projects in the Language and Cognition Laboratory of the Department of Psychology.

Boston Architectural Center Affiliation

Northeastern University students wishing to take courses at the Boston Architectural Center (BAC) may do so through the affiliation between the BAC and the University's Department of Art and Architecture.

The BAC is one of the country's oldest and most respected architectural schools. It is a nationally recognized leader in providing full-time concurrent work-study opportunities for those interested in careers as practicing architects. Besides being an independent fully accredited degree-granting institution, it is the home of the Boston Society of Architects. As such, it serves as a principal focus for a variety of professional activities in the New England area.

The BAC is conveniently located within a short walking distance of the University's Huntington Avenue campus. The NU/BAC affiliation provides choices of courses at either location, with day classroom courses mainly at the University and evening classroom and studio courses at the Center. For studio courses, the Art and Architecture Department's course 27.205, Introduction to Architectural Design (or equivalent) is a prerequisite.

Interested individuals should contact the program coordinator in the Department of Art and Architecture, Professor Peter Serenyi, 401 Rugles Hall.



Boston Lyric Opera

The Boston Lyric Opera is a professional opera company dedicated to providing performance opportunities for New England singers, directors, and designers. The company performs four operas a year that are fully staged with orchestra. The Boston Lyric Opera is in residence at Northeastern University and gives all its performances at the University's Alumni Auditorium. In the fall of 1983, the company will be starting an opera workshop program for singers that will take place on campus.

British Government Studies (PAGES) Study Abroad

The Political Science Department and the London Political and Governmental Education Studies (PAGES) Group have joined together to offer American university students the opportunity to learn and gain working experience at the very heart of British politics as part of their study abroad program.

Special emphasis in this program is given to the theory and practice of elections and the workings of two great but very different institutions.

the British Parliament and the European Parliament. In addition to taking two twelve-week lecture courses in British Government, students will be fully involved, through an internship, working with Members of Parliament, candidates, and campaign organizers, or constituency agents as they are known in Britain. One half-price scholarship is available to a Northeastern University student each year. Up to sixteen credits may be earned in the three-month program. Application and eligibility information is available from the Department of Political Science.

Intensive Summer Chinese Language Study

The Chinese Language Study offers students from Northeastern and other educational institutions the opportunity for intensive language study over nine weeks in Peking, China. Courses are offered at four levels: (1) introductory; (2) advanced beginning; (3) intermediate; and (4) advanced seminar. Northeastern offers credits at the lower two levels. Chinese teachers offer the language courses; American Chinese language teachers provide supplementary grammar courses. Helen Lin of Wellesley College serves as Curriculum Consultant and Dr. Holly Carter, head of the Asian Studies Center, supervises the overseas program.

Students attend classes for four hours each day, five days a week, at the Branch Campus of the Foreign Language Institute. Field visits and seminars help to highlight Chinese geography, art, and theatre. Students live in foreign student dormitories at the Institute and experience firsthand the arduous day-to-day lifestyle of a unique foreign country; their education extends well beyond the classroom.

Future direction of this experimental summer program is in the discussion stages. Courses may be offered to other practitioners and professionals; for example, the social worker from an American Chinese community, or the lawyer or engineer with a business interest in Chinese markets. The study model developed at the Peking Institute may be expanded to other academic institutions, and language courses may be refined to include both survival language and an introduction to cultural studies. The program may extend or refocus its interest on the language and culture of Japan. Further information is available from Dr. Carter in the Asian Studies Center Office.

Concert Arts Orchestra of Boston

Boston's only European-style string chamber orchestra, the Concert Arts Orchestra of Boston, is based at the Northeastern University Division of Fine Arts. Modeled after such renowned ensembles as the Stuttgart Chamber Orchestra and the I Solisti di Zagreb, the Concert Arts Orchestra is composed of fifteen virtuoso string players performing the masterworks of the string chamber repertoire. Founded in 1981 and continuing under the musical direction of music professor David Sonnenschein, the orchestra's season includes annual concerts at Northeastern presenting the music of Bach, Haydn, Dvorak, Vivaldi, and others. Radio broadcasts of the orchestra's performances have been aired locally and are scheduled for the coming year on National Public Radio.

Economic Planning and Policy in Italy, M.S.

The Department of Economics and the College of Arts and Sciences at Northeastern have joined the Consiglio Nazionale delle Ricerche (CNR), the national research council in Italy, to offer graduate courses in economics in Italy.

The courses are conducted in Italian and are taught by teams of Northeastern and CNR professors. Simultaneous translation is provided for faculty who do not speak Italian. Two weeks in duration, the courses consist of more contact hours than similar courses taught on the domestic campus and are a rigorous blend of theory and practical application. Participants are generally sponsored by their employers in government and industry from throughout Italy.

Of particular interest to undergraduates is the summer abroad portion of this program taught in English that is run in Northern Italy and is open to juniors and seniors majoring in Business or Economics.

School for Field Studies

The College of Arts and Sciences is affiliated with the School for Field Studies (SFS), a nonprofit educational organization that offers one- and two-month field study expeditions throughout the world. Sample ecosystem research expeditions are: Marine Mammal Biology and Conservation, Glacier Bay, Alaska; Wildlife Management, Athi Plains, Kenya; and Coral Reef Ecology, St. John, U.S. Virgin Islands. Programs combine applied academics with training in field research methods and teamwork—an exciting hands-on approach to science. Credit is granted for the coursework. Students of all levels and disciplines are eligible, but participation of Northeastern University students is limited proportionate to the total number of outside participants in the SFS program. Additional information may be obtained in the Arts and Sciences Dean's Office.

Division of Fine Arts

The Division of Fine Arts coordinates the University's academic and performing arts activities. Comprising the departments of Art and Architecture, Drama, and Music, the Division was established in 1981 to enrich and expand the role of the arts at Northeastern. The Division develops arts curricula through the support of existing programs, creates interdisciplinary courses to provide a forum for intellectual stimulation and professional development, and generates programming in both traditional and experimental art forms.

As the producer of professional arts events at Northeastern, the Division offers a broad range of programs in film, music, dance, literary arts, visual arts, theatre, and performance art. A year-round schedule of events for both University and Boston audiences includes gallery shows, dance performances, artistic residencies, concert series, and theatrical presentations.

To fulfill its role as an arts service organization, the Division administers an on-campus professional box office, a corridor art gallery, and an arts publications program. The Central Box Office in 105 Ell Building provides tickets to all University-sponsored arts events as well as passes and discount tickets to area museums, theatres, and arts organizations. The Division's publications include the *ARTSSCENE* calendar and newspaper; *NEW MUSIC-BOSTON*, a contemporary music listing for the Boston area; and numerous programs, brochures, and catalogs. A new *ARTSSCENE* magazine will begin publication in 1983 with features on

the activities and accomplishments of the Division and its constituent departments.

Affiliations with local and national arts groups enable the Division to expand and strengthen the scope of arts activities at Northeastern. The Boston Lyric Opera, the Concert Arts Orchestra of Boston, and the Boston chapter of the League of Composers—International Society For Contemporary Music work through the Division's auspices to produce full seasons of performances.

To ensure that the arts remain an important and vital part of the University and its community, the Northeastern University Division of Fine Arts encourages both academic excellence and professional achievement. By sponsoring new works commissioning programs, by presenting important emerging artists, and by incorporating contemporary notions of the role of the artist in society, the Division of Fine Arts maintains an important position in the cultural and educational life of this modern urban university.

French for Business and Economics Students

Elementary French for Business and Economics students is designed for students who wish to study French with the intent of enhancing their career opportunities. The program is particularly aimed for students interested in international business. It offers, along with a thorough study of grammar and insights into the French way of life, some specialized vocabulary related to the business world and an immediate introduction to French business texts. The course serves as a preliminary step for the student wishing to gain co-op placement in France. Additional information may be obtained from Juliette Gilman in 326 Holmes Hall.

Business German

This course taught in English is designed for students of business and economics seeking to develop competence in the reading and understanding of texts produced by the German business community and trade media. Course goals include

1. a working knowledge of grammatical structures and terminologies used in business writings;
2. development of effective comprehension procedures used by professionals for efficient reading;
3. introduction to the Federal Republic of Germany, its industrial geography, trade relations with the United States, and its role as a major partner in international commerce.

Readings from English-language trade publications assure a steady influx of outside information and serve as the basis for weekly summary assignments designed to upgrade student's writing skills.

Students may use this course as a pre-stage to the conversation-based German offerings if speaking competence is needed for a business-oriented co-op in Germany (see International Cooperative Education) as part of Northeastern's exchange program. Additional information may be obtained from Ross Hall in the Modern Languages Department.

Minor in Business

The College of Business Administration, in collaboration with the College of Arts and Sciences, offers a minor in Business for all students outside the College of Business Administration. This minor may be valuable to students seeking jobs both before and after graduation, in either the public or the private sector.

The courses in the minor cover substantially the areas of business required by the American Assembly of Collegiate Schools of Business as part of the relevant "common body of knowledge."

The business courses included (with one exception, Accounting) are the same as those taken by all students in the College of Business Administration. Thus, the minor should encourage a cross-fertilization of ideas that will be beneficial to both CBA and non-CBA students.

For details, including full requirements and program admission standards, interested persons should consult the Dean's Office of the College of Arts and Sciences or the Undergraduate Programs Office of the College of Business Administration.

Center for Humanities

The Center for the Humanities at Northeastern University supports teaching and research activities in cross-disciplinary areas that connect the traditional humanities with science and mathematics, and with such professional curricula as engineering, business, criminal justice, and allied health. Though it offers no courses, the Center promotes the application of human-values perspectives and problem-solving techniques to the professions in various conferences, workshops, and presentations. The Center is located in 443 Meserve Hall.

Independent Major

After their second quarter, students may petition the Dean of the College that they meet the requirements for the Bachelor of Arts degree as independent rather than departmental majors. The independent major must center on a discipline or combination of disciplines in the arts and/or sciences.

A faculty member acting as the student's academic adviser initially reviews the program, which must meet all College requirements. The program is then submitted to the appropriate committee for final approval. Requirements and procedures for the major should be discussed in advance with an academic adviser in the dean's office.

International Cooperative Experience

Northeastern extends its unique program of Cooperative Education to the international scene by offering its competent upperclass students the opportunity for suitable international placement. This program operates on a reciprocal exchange basis in cooperation with overseas institutions and sponsoring agencies. Students whose academic, linguistic, and professional experience make them attractive candidates for overseas positions work in Great Britain, Germany, Sweden, Ireland, France, and Canada. Each year approximately five hundred of the most highly qualified are accepted. By creating a mutually beneficial situation for

students and employers, the program begins to meet an increasing need for qualified professionals who possess international expertise and language proficiency necessary to assist companies to expand their overseas markets. Students may obtain detailed information about the program from the Department of Modern Languages or the International Cooperative Education Office.

Irish Studies

The Irish Studies Committee promotes Irish Studies at Northeastern University through expansion of the curriculum, cultural programs on Ireland and Irish-Americans, and co-operative exchanges of Irish and American students for work and study. The Distinguished Speakers Series presents opportunities for University faculty and staff to develop mutually beneficial relationships with Irish counterparts in all disciplines. The committee has encouraged cooperation with all departments of the University.

Through International Co-op, students are placed in various businesses and agencies in the Republic of Ireland and in Northern Ireland. The Working Papers in Irish Studies Series provides an opportunity to disseminate manuscripts of current interest. Cultural efforts include a film series, development of a library collection, and art exhibitions, as well as student activities in the Irish Student Club. Plans to develop an Interdisciplinary Minor are underway. Dr. Ruth-Ann Harris, Department of History, and Dr. Bruce Logan, Department of Political Science, serve as coordinators of Irish Studies.

League of Composers— International Society for Contemporary Music

Northeastern University is the home of the Boston chapter of the League of Composers—International Society For Contemporary Music, one of the oldest and most prestigious international organizations dedicated to the promulgation of new music. With chapters in more than forty countries and with a membership that has included Schönberg, Stravinsky, Bartók, and Ravel, the League—ISCM has introduced to the public works of some of the most important composers of the twentieth century. Under the direction of Professor Dennis Miller of the Northeastern Music Department and through the auspices of the Division of Fine Arts, the League's activities at Northeastern include the presentation of an annual concert series featuring the finest interpreters of the contemporary idiom, sponsorship of a new-works commissioning program, and publication of *NEW MUSIC—BOSTON*, a calendar listing of Boston new music activities.

Linguistics Minor

In collaboration with four other departments—English, Modern Languages, Philosophy and Religion, and Sociology/Anthropology—the Psychology Department offers the Linguistics Minor, which reflects the current research of such diverse people as linguists, sociologists, psychologists, language educators, speech pathologists, neurologists, and teachers of second languages. The minor in Linguistics complements the study of any other language-related area such as computer science, anthropology, brain physiology, or language teaching. Specialized concentrations within linguistics include psycholinguistics, stylistics, language and culture, second language teaching and applied linguistics, theoretical linguistics, and American Sign Language linguistics. Many research opportunities exist through directed work study.

Marine Studies Minor

The Marine Studies minor reflects the educational resources and maritime heritage of New England and offers the undergraduate student the opportunity for an unusual focus in a liberal arts education. Study of the oceans, like approaches to other intellectual frontiers, demands an integrated interdisciplinary approach. The Marine Studies minor is structured to allow a primary, although not exclusive, emphasis on either the scientific or the social science/humanistic study of the oceans. Some physical interaction with the sea is required through demonstrated achievement in a specific marine-related skill such as scuba diving, sailing, or piloting/navigation. The minor is not the principal preparation for employment in marine related positions but rather an opportunity to enrich a liberal education. Full information is available from Dr. Paul Rudy, Director of the Center for Marine Science and Maritime Studies.

Media Services Minor

What does it mean to live in a media-oriented society? What impact does the media have on politics, economics, and social mores? In the Media Services minor, the student is exposed to the concept of media from a variety of perspectives offered through different departments. For example, courses in English treat film as media; in Communications, media production; in Journalism, news as media; and in Art, photography as media. The student is given the opportunity to pursue courses in a structured combination and to develop a meaningful sequence of study. Each student completes requirements in media production and application of media. From a vocational point of view, the minor as a complement to a major in Communications, Journalism, English, or Art may help to prepare students for careers in business and industry, news service, and radio/television.

Personality and Social Psychology

The Departments of Psychology and Sociology/Anthropology have combined their resources to offer students a new interdisciplinary specialization that can be pursued for a degree in either of these academic departments.

The specialization in Personality and Social Psychology offers students the opportunity to acquire a systematic understanding of various life processes, such as childrearing, aggression, anxiety, prejudice, attitude formation and change, moral development, and psychopathology. It includes studies of attraction and love, conformity, formation of identity, helping behavior, morality, and other related topics.

Students pursuing an interdisciplinary specialization take courses in both the Psychology and Sociology/Anthropology Departments. However, the student may select the department in which the specialization will be pursued.

In making this selection, the student should consider how each department differs in methods and level of analysis. These differences as well as various course offerings are outlined in a brochure titled *A New Specialization: Personality and Social Psychology*, which can be obtained by writing to the Department of Psychology (234 Nightingale Hall) or the Department of Sociology/Anthropology (500 Holmes Hall). Also, prospective students should discuss their potential department affiliations with Professors Golden or Levin (Sociology/Anthropology) and Professors Harkins or Zamansky (Psychology). (This is an interdisciplinary program that is separate from the Social Psychology specialization outlined on page 90.)

Combined Program with Professional Schools

Students who have completed at least three-fourths of the course work required for a baccalaureate degree in the College of Arts and Sciences and are accepted into an approved professional school of dentistry, law, medicine, optometry, osteopathy, or veterinary medicine will be eligible for the Bachelor of Arts or Bachelor of Science degree at the end of their second year in professional school. At least two-thirds of work for the baccalaureate degree must be earned in residence at Northeastern, and all other College of Arts and Sciences requirements must be fulfilled, the residence requirement having been completed prior to entrance into the professional school. Under this program, a preprofessional student may reduce by one year the time normally required for obtaining both the undergraduate and professional degrees.

Russian Studies Minor

The Russian Studies Minor is an interdisciplinary program in Russian studies. It provides students with an opportunity to develop a broad and multifaceted understanding of an important people by studying their society, history, economy, culture, and behavior. The program attempts to help students become knowledgeable about an important culture that generally receives quite limited treatment in secondary schools. Increasing students' awareness of how the U.S. media treats Russian culture and politics is another goal of the program. The minor may help to prepare students for further graduate study in specialized areas such as government, teaching, journalism, and business, and may provide the beginnings of such specialized knowledge that will enhance students' career opportunities in the absence of graduate study in the aforementioned employment fields.

SeaQuarter

SeaQuarter is a liberal arts program which provides the responsibility of operating and crewing a large U.S. flag schooner, the *Harvey Gamage*, on journeys along the Eastern seaboard and through the Caribbean Sea. The SeaQuarter itinerary includes ports-of-call from Maine to the Caribbean at research institutions, museums, and historical and scientific sites. Confrontation with the physical presence of the Atlantic coast provides the insights and experiences that cannot be projected with comparable intensity from a textbook or classroom ashore. SeaQuarter offers an environment where learning is interwoven with mutual dependence for survival, where each individual can find and challenge the limits of her/his capabilities. The set of courses provides a broad academic exposure to the sea and the impact of the sea on civilization in the artistic, social, and scientific sense. Participants take a full load of courses in addition to helping crew the 110-foot ship. SeaQuarter is available to both nonscience and science students of at least sophomore status. Full information is available from the Center for Marine Science and Maritime Studies.

Elementary Spanish for Criminal Justice and Human Service Majors

This course is intended for students majoring in Criminal Justice or Human Services who will need to use Spanish in police work and in social service settings. The grammar taught is the same as in other elementary

Spanish courses. The vocabulary is adapted in particular needs and interests of the students. Role-play is used extensively and students practice "intake interviews" in the course.

Trent Polytechnic Exchange Program

The Trent program presents an opportunity for upperclass Northeastern students to study theory and practice of social and human services in the United Kingdom. Students participate in an academic term at Trent Polytechnic in Nottingham, England, and an additional six-month cooperative experience in appropriate institutions and organizations.

Students study the development of contemporary British social structure, its institutions and strategies to deal with modern social problems. Their assignment to a specific institution offers a chance for firsthand observations of a particular social or human service.

Trent is the largest practitioner of cooperative education in the United Kingdom. Community Service Volunteers (CSV), an organization comparable to our VISTA, places students for the cooperative period. CSV is an educational charity which involves young people in full-time community service work throughout Great Britain (for example, diagnostic centers, schools for emotionally disturbed children, or social service departments in local communities).

These two organizations provide a unique and challenging program for Northeastern students who qualify academically. The program can accommodate twenty to thirty students. Interested students should contact the Department of Sociology and Anthropology or the International Cooperative Education Office.

Urban Studies Minor

The Urban Studies minor offers courses with an urban orientation in four main areas: (1) urban problems and policies; (2) urban form and design; (3) African-American studies; and (4) urban humanities. The minor may be useful for the student who majors in one of the social sciences (history, economics, political science) as well as the student with a career orientation towards political science or business administration in urban areas. The minor presents the opportunity to study the approach of different disciplines to solve the same set of urban problems. Studying the viewpoint of artists, minorities, economists, and others, the student

is given the chance to develop a broader perspective on the identity of urban areas. Like an art appreciation course, the minor provides background information and criteria for appreciation of the urban environment. Students may contact any one of the participating departments or the Dean's Office for additional information.

Women's Studies Minor

Men and women today face the challenge of combining family and career. Other important challenges include the changing position of women in society and changing sex roles in general. The Women's Studies minor helps students examine the basic assumption of a variety of academic disciplines from the perspective of women. The minor brings together courses from a number of disciplines and allows students to design a flexible program suited to their individual needs and interests. Dr. Winifred Breines, Department of Sociology and Anthropology, may be contacted for further information.

New England Quarterly

The *New England Quarterly*, published without interruption since 1928, is America's leading historical review of New England life and letters. Each book-length issue presents major articles in the fields of literature, history, and culture; a special feature of brief memoranda and recently discovered documents; and a substantial book review section.

Romanticism Past and Present

Romanticism Past and Present is a journal that publishes articles and reviews of books dealing with a Romantic sense of the past. After changing its title from *Milton and the Romantics* in 1981, the journal shifted direction to make it responsive to a broadening conception of Romanticism and Romantic studies. Presently, *Romanticism Past and Present* publishes articles, notes, and reviews. Seeking to develop a comparatist and interdisciplinary orientation, the journal brings interdisciplinary and international concerns to bear on the study of English Romantic literature.

Studies in American Fiction

The journal *Studies in American Fiction* publishes articles, notes, and reviews on all aspects of prose fiction of the United States. Readership and contributors represent an international community of scholars of American literature. The journal's broad professional purpose is to publish new discoveries, new documents, and new interpretations of important works of American fiction. The publication of Volume 10 in 1982 marks ten years of Northeastern's sponsorship of *Studies in American Fiction*, the first scholarly journal to be published at the University.

Tennessee Williams Review

The *Tennessee Williams Review* publishes critical and historical articles about the plays of Tennessee Williams and their own productions; articles about Williams himself, his fiction and poetry, and about his place in the American theatre; as well as bibliographies, book and play reviews, news, notes, and abstracts of articles about Williams appearing in other journals. The *Tennessee Williams Review* has an international readership composed of scholars and theatre artists who are interested in Williams's writing. The journal appears twice a year and has been at Northeastern since 1982.

Graduation Requirements

Quantitative Candidates for either the Bachelor of Arts or Bachelor of Science degree who entered in or after the fall quarter of 1974 must successfully complete 176 quarter hours of credit, of which thirty-two quarter hours may be taken outside the College of Arts and Sciences. In addition, only four quarter hours of Physical Education credits and no ROTC credits may be used to meet degree requirements.

Residency Candidates must complete either 75 percent of the degree credit at Northeastern or the last three full quarters (a minimum of twelve full courses) at Northeastern.

Qualitative Candidates must achieve a minimum cumulative average of 2.0 (grade of C).

Freshman English All degree candidates must complete one quarter of Freshman Composition and one quarter of Introduction to Literature. Normally, this will be done by completing courses 30.113 and 30.114 at Northeastern.

Major Candidates must complete successfully the courses specified as major requirements. A complete listing of these required courses is published in the *Basic Day College Course Descriptions and Curriculum Guide*.

Distribution All course work offered in the College of Arts and Sciences curricula is identified within one of three broad areas: Fine Arts and humanities, social sciences, and science-mathematics. All Bachelor of Arts candidates (and Bachelor of Science candidates in English and Speech Communications) must complete forty quarter hours in the two areas outside of their major. For example, a major in History, which is considered a social science, must complete forty quarter hours of course work in the humanities and science-mathematics areas. The course work for distribution must contain a minimum of sixteen quarter hours in one area and twenty-four quarter hours in the other area of the curriculum. A major in History, for example, satisfies the requirement by completing course work in one of the following ways: sixteen quarter hours in humanities and twenty-four quarter hours in mathematics and/or science, or twenty-four quarter hours in humanities and sixteen quarter hours in mathematics and/or science, or twenty quarter hours in mathematics and/or science and twenty quarter hours in humanities. The departments/majors are listed here with the appropriate curriculum area headings:

Fine Arts and Humanities Art, Drama, English (all offerings beyond the freshman level), Modern Languages (all offerings except elementary levels), Music, Philosophy, Journalism, and Speech Communications courses.

Social Sciences African-American Studies, Anthropology, Economics, History, Human Services, Political Science, Psychology, Sociology, and Linguistics.

Science-Mathematics Biology, Chemistry, Mathematics, Earth Sciences, and Physics.

To determine the distribution requirement met by a course if selected from the interdisciplinary programs in Human Services, African-American Studies, or Linguistics, students are advised to consult an academic adviser in the Dean's office.

Foreign Language All candidates for the Bachelor of Arts degree must attain a level of proficiency in a modern foreign language indicated by passing grades in intermediate-level college courses or by meeting a comparable criterion that has been approved by the Modern Languages Department.

A **conditional exemption** from this requirement may be granted in the following situations:

- 1) students who earned an average grade of C or better in a full, four-year language sequence in secondary school
- s) students who earned an average grade of A in a three-year language sequence in secondary school.

A conditional exemption **must** be confirmed by taking a proficiency examination during the first quarter at the University. A sufficiently high score will verify the exemption; otherwise the student will be advised of the appropriate language course to take in the following quarter.

An **absolute exemption** will be granted to students: 1) for whom English is a foreign language

- 2) who receive a score of 550 or better in the Language Achievement Examinations.

For students who have not met the foreign language requirement at the time of entrance, the entry level into foreign language study depends upon the scope and level of prior study. The normal sequence for students with no prior preparation is two quarters of elementary-level language and two quarters of intermediate-level language. The Modern Languages Department will determine an appropriate entry point at which students who have partial language preparation may begin completing the requirement.

Graduation with Honors

Candidates who have completed all degree requirements and have attained superior grades in their academic work will be graduated with honor (3.000 to 3.499 cumulative average); high honor (3.500 to 3.749 cumulative average); or highest honor (3.750 to 4.000 cumulative average). Transfer students who have completed all degree requirements and at least six full quarters of course work in the College of Arts and Sciences at an honors level as defined above may graduate with honors. The course work completed at other institutions, however, when weighed and averaged in with Northeastern University's work, must equal the University's honors level. The level of honors designated on the Northeastern diploma and transcript shall be no higher than the honors level attained as a Northeastern student.

Commencement Exercises

The College of Arts and Sciences holds commencement exercises each June and September.

Accreditation

All programs in the College of Arts and Sciences are fully accredited by the New England Association of College and Secondary Schools.



Boston-Bouvé College of Human Development Professions

Paul M. Lepley, Ed.D., *Dean*

Humberto F. Goncalves, B.S., *Associate Dean*

Charles F. Haley, Ed.M., *Associate Dean*

Janice Walker, A.B., *Assistant Dean, Graduate School*

Jean Czajkowski, *Assistant Dean*

Program Aims

Boston-Bouvé College of Human Development Professions has seven undergraduate departments—Curriculum and Instruction, Foundations of Education, Speech-Language Pathology and Audiology, School and Community Health Education, Physical Education, Physical Therapy, and Recreation and Leisure Studies. The College also has graduate programs in Counselor Education, Curriculum and Instruction, Educational Administration, Foundations of Education, Rehabilitation Administration, Special Education, Speech-Language Pathology and Audiology, Physical Education, Physical Therapy, and Recreation and Leisure Studies, with the Master of Education, Master of Science, CAGS, and Doctor of Education degrees conferred.

The primary goal of the College is to provide the very finest education for every student. To meet demands for fully qualified personnel, the College strives to develop the independent, self-reliant individual.

A View of the Five-Year Program Professional preparation is based in the liberal arts and sciences, with orientation to each profession beginning in the freshman year. There is a concentration on specific competencies spaced throughout the programs and on professional theory and practice in the last two years. In the junior or senior year, all students have the opportunity to synthesize knowledge and skills through supervised experiences in clinical practice, student teaching, field experience, or internships. Each curriculum is enriched by cooperative experiences that, for the most part, are related to a student's area of specialization. At times, these experiences are professionally unrelated, but are always concerned with people, thus providing an opportunity of inestimable value in any career.

Facilities

The facilities of the College are quite diversified. Dockser Hall houses administrative and faculty offices, classrooms, a gymnasium, dance studio, physiology of exercise laboratory, and locker and shower facilities, as well as a community recreation laboratory, arts and crafts area, seminar rooms, and a motor-learning laboratory. The swimming pool, weight room, handball/racquetball courts, offices, and shower and dressing facilities are located in the Barletta Natatorium complex. The Cabot Building, attached to Barletta, contains one very large gymnasium and another well equipped for gymnastics, as well as wrestling, exercise, and weight training rooms, an indoor track and activity area, offices, and extensive locker room space.

In Room 1, Holmes Hall, the Department of Curriculum and Instruction provides a Reading Clinic, which permits private corrective instruction of fourteen persons, usually area school children, as firsthand experience related to the department's courses in reading instruction. The department also provides an additional resource in the F. Andre Favat

Center, in Nightingale Hall, which houses books and other materials representative of school and agency tools of instruction and service. Forsyth Building is the location for a Speech-Language-Hearing Clinic, where students may observe, through one-way glass or television monitors, the actual delivery of clinical services. This clinic and a Speech Communications Research Laboratory are facilities of the Department of Speech-Language Pathology and Audiology.

The Physical Therapy Department is located in Mary Gass Robinson Hall. On the third and fourth floors are the physical therapy faculty offices, the Lupean Professional Library, classrooms, and three laboratories. The laboratories are designed and equipped specifically for the practice of clinical procedures. The library's reading room supplements the University library, maintaining an up-to-date collection of physical therapy and medical books for use by students and faculty in the program and the College.

The Warren Center serves as a practical laboratory for the College. Its athletic fields and tennis courts, ropes course, natural setting of lake, woods, fields, streams, winterized cottages, and Hayden Lodge provide year-round opportunities for outdoor learning twenty-five miles from the Boston campus. Courses, conferences, seminars, and workshops are conducted at the Center throughout the year and thus serve University and community needs.

Admission

See page 229 for information concerning admission. In the third year, prior to the first supervised clinical education experience, Physical Therapy students must be examined either by physicians in the University Health Services, at a moderate fee, or by a personal physician. Students majoring in programs offered by the departments of Curriculum and Instruction, Health Education, and Physical Education must submit evidence that they are free of tuberculosis before engaging in student teaching.

Graduation Requirements

Degrees Students graduating in Elementary and Secondary Education, Human Services, Health Education, Physical Education, and Speech and Hearing earn the degree of Bachelor of Science in Education; those completing the Recreation and Leisure Studies program are awarded the Bachelor of Science in Recreation and Leisure Studies degree; and students graduating in Physical Therapy receive the degree of Bachelor of Science in Physical Therapy. These degrees are awarded to qualified candidates who have completed the prescribed curricula. Student teaching, field experience, or clinical practice is an integral part of the curriculum and is required for graduation.

Qualifications

Quantitative The quarter hours required in each curriculum differ.

	Q.H.
Elementary/Secondary Education	181/177
Health Education	179
Human Services	176
Physical Education/Athletic Training	180/185
Physical Therapy	170
Recreation and Leisure Studies	172
Speech and Hearing	177

Students must satisfy the requirements of the Department of Cooperative Education before they become eligible for their degrees.

Senior-year course work and required experiences must be completed in full-time residence at Northeastern University or in an educational setting approved by the College.

Qualitative The overall cumulative quality-point averages required to enter each class level are explicitly stated in the Student Handbook. Throughout the professional sequence, students must maintain required averages and demonstrate a high level of personal and professional maturity to continue field practice and be approved for graduation. Because of accreditation recommendations and differences in curricula, variations in qualitative requirements may occur.

Transfer students in any curriculum may be accepted into the College at upperclass levels if there are available spaces. Each transcript is individually assessed for qualification, placement, and course design.

Graduation with Honor

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a number of this group may be graduated with high honors or highest honors. Students must have been in attendance at the University for at least six quarters before they become eligible for honors at graduation.

Program Accreditation

The curriculum in Physical Therapy is accredited by the American Physical Therapy Association. Elementary and Secondary Education, Health Education, Physical Education, and Speech and Hearing are accredited by the National Council for Accreditation of Teacher Education. Programs in Early Childhood, Elementary Education, School Health Education, and Physical Education are also state-approved under the Interstate Certification Compact.

Licensure/Registration

All fifty states have laws governing the practice of physical therapy. In order to be eligible for employment to practice physical therapy, graduates must meet the specific legal requirements of the state in which they wish to work. In most states the requirements include graduation from an accredited school of physical therapy and a satisfactory grade on a written examination. Graduates are responsible for finding out what the specific legal requirements are to practice in the state in which they seek employment.

Certification

Upon successful completion of the programs in Early Childhood, Elementary Education, School Health Education, and Physical Education, students are eligible to apply for certification by the Commonwealth of Massachusetts. Certification is required for public school teaching, but does not guarantee a position. Reciprocal certification is available in many states of the United States. Graduates are responsible for determining the requirements of the states in which they are interested.

Focus on the Student

There is a uniqueness about this College. Perhaps it is the personal touch, a keen interest in every man and woman, expressed in individualized advice and counsel. The College has its own professional clubs and Dance Theatre. Its social clubs and exciting assemblies contrast with study rooms, seminars, and places for research. There is skiing in winter, camping in summer, and year-round sports.

Community service is stressed in every department—service to those with special needs: the physically handicapped, inner-city youth, the aging.

Department of Curriculum and Instruction

Professors

Melvin E. Howards, Ph.D.
Maurice Kaufman, Ph.D.
Paul H. Tedesco, Ph.D.

Assistant Professors

Thomas H. Clark, M.A.
Carlton B. Lehmkuhl, Ph.D.
John F. Maguire, Ed.M.

Associate Professors

Nicholas J. Buffone, Ph.D.
Leslie A. Burg, Ed.D.
Mary J. Lee, Ed.M.
Harold A. Miner, Ed.D.
Sandra M. Parker, Ed.D.

The Department of Curriculum and Instruction provides teacher preparation programs in a variety of fields and levels. To assist students enrolled in these programs, the Department utilizes three support units; the Reading Clinic, the F. Andre Favat Learning Resources Center, and the Russell J. Call Children's Center (a day-care center). The Russell J. Call Children's Center provides day care for eligible children whose parents are faculty, staff, and students of Northeastern University. Information on the Center's Susan L. Orchard Memorial Fund may be found on page 272.

The aims of the Department are to make it possible for students to gain certification in a teaching major and/or level and to acquire the competencies necessary for success in teaching.

Teacher Preparation

Early Childhood Education (K–3) Students in the Early Childhood Education program have the opportunity to pursue studies in the College of Arts and Sciences and in other basic colleges of the University, as well as in the Boston-Bouvé College of Human Development Professions. This broad academic background, combined with experiences in the Cooperative Education program, permits the development of a solid professional base. The Russell J. Call Children's Center, a day-care facility for children ranging in age from two years and nine months to six years, provides experiences in fieldwork for students in the Early Childhood Education program. Pre-student teaching experiences in appropriate field settings are an integral part of a number of required courses.

Elementary Education (Grades 1–6) Elementary Education majors acquire a broad academic base by enrolling in courses chosen from the various colleges of the University. Acquiring the necessary teaching competencies is the result of not only the course experiences, but the work experiences in the Cooperative Education program and in the pre-student teaching field activities. In addition to those courses required of all Elementary Education majors, students are expected to choose an area of emphasis from one of the following: Humanities, Language-Reading, Science-Mathematics, or Social Science.

Emphases usually consist of 40 quarter hours of courses. Each emphasis has been designed to help focus the student's studies but does not lead to certification in that specific area. It may, however, serve as a catalyst for further study in a graduate program.

Special Education Minor Students majoring in elementary education may complete a minor in special education which will permit them to apply for certification to teach children with moderate special needs in the Commonwealth of Massachusetts.

Middle School Education (Grades 5–9) Students enrolling in this major are expected to demonstrate competence in all of the academic subjects generally taught in these grades. Additionally, the equivalent of a college minor in one academic subject is required. The details of this major are worked out with an adviser early in the academic career of the student.

Secondary Education (Grades 9–12) Those interested in teaching grades 9 through 12 may major in one of the following teaching areas: Biology, English, General Science, Mathematics, or Social Studies. Programs in Secondary Education provide not only for the acquiring of a major in one of the fields but also for gaining experience through Cooperative Education and through required courses and pre-student teaching field experiences. All of these assist in the student's effort to achieve the needed competencies.

Student Teaching Student teaching is a full-time experience for a complete academic quarter during the senior year. It follows several experiences that are designed to help the student toward a rewarding quarter of student teaching. A University professor and a cooperating classroom teacher have shared responsibility in the supervision of each student teacher.

Teacher Certification

Inasmuch as public education is a state responsibility, each state prescribes the conditions under which persons may be licensed to teach in its public schools. The requirements for obtaining a certificate for teaching, therefore, vary among the different states.

These programs are designed to meet the requirements for certification in the Commonwealth of Massachusetts and in certain other states. Details may be obtained from the Office of the Dean.

Foundations of Education

Joseph Meier, Ed.D., *Associate Professor and Chairman*

Professors

E. Vaughn Guloyan, Ed.D.

John D. Herzog, Ph.D.

Mervin D. Lynch, Ph.D.

Associate Professors

Ronald E. Baptiste, Ed.D.

Susan E. Ellerin, Ph.D.

Irene A. Nichols, Ed.D.

Barbara A. Schram, Ed.D.

The Department of Foundations of Education offers basic and advanced courses in the Humanities and Behavioral Sciences for students in Education, Human Services, and other Human Development Professions. The aims of these courses are to promote understanding of the processes of intentional socialization and deliberate intervention in people's lives and to familiarize students with the body of knowledge dealing with the principles of human development and well-being.

The courses are open to students across the University provided they can meet the prerequisites listed in the *Basic Day Colleges Course Descriptions and Curriculum Guide*:

- 50.114 Education and Social Science
- 50.121 Human Development and Learning I
- 50.131 Human Development and Learning II
- 50.132 Creative Expression in Children
- 50.133 Educational Applications of Social Psychology
- 50.134 Mental Health in Teaching
- 50.135 Cross-Cultural Studies of Child Rearing and Education
- 50.136 Language and Cognition: Educational Implications
- 50.137 Seminar in Adolescent Psychology
- 50.138 Seminar in Human Learning and Motivation
- 50.139 Seminar in Early Childhood Development
- 50.141 Measurement and Evaluation
- 50.142 Introduction to Educational Statistics
- 50.152 Comparative Education
- 50.153 Philosophy of Education
- 50.154 Current Issues in American Education
- 50.161 Seminar in Group Process
- 50.162 Day-Care and Nursery Schools: Social and Cultural Origins
- 50.163 Schools as Social Systems
- 50.164 Class and Ethnic Relations in Education
- 50.165 Organization and Politics of School Systems
- 50.166 The Human Services Professions
- 50.167 Educational and Psychosocial Development
- 50.168 Education and Social Change
- 50.190 Directed Study

Physical Education Department

Carl S. Christensen, Ph.D., *Professor and Chairman*

Professors

John W. Fox, Ed.D.
Richard C. Zobel, Ed.D.

Associate Professors

Robert S. Curtin, Ed.D.
William J. Gillespie, Ed.D.
Dorett M. Hope, Ed.D.
Kerkor Kassabian, Ed.M.
Hugh D. McCracken, Ph.D.
Mary P. Nicholson, M.S.
Judith A. Noblitt, M.Ed.
Harold A. Walker, A.B.

Assistant Professors

Glenn A. Boden, M.Ed.
Marilyn A. Cairns, M.S.
John A. Clayton, Ph.D.
Evelyn B. Howard, M.S.
Sara A. Umberger, M.A.
Linda B. Zaichkowsky, Ph.D.

Instructor

Michael Gaudiano, M.S.

Professional Preparation with Teacher Certification

The Department of Physical Education conducts an undergraduate professional program for teacher certification and noncertification personnel in Physical Education, physical education electives for all University students, and the intramural/club program for men and women.

Aims The teacher certification program in Physical Education is designed to offer students the opportunity to prepare themselves as exercise specialists and professionals capable of developing the materials and methods appropriate to teaching physical education in public and private schools at all levels—elementary, secondary, and college. Its graduates are qualified as athletic coaches and/or trainers, physical education and dance teachers, directors of athletics, supervisors of physical education, and leaders in YMCAs, YWCAs, health clubs, other youth organizations, and exercise specialists in industry and business.

Description of the Major Students majoring in this program are offered a strong background in general education. Elective hours are required in the areas of science, social science, and humanities. Courses in physical education include history, philosophy, principles, curriculum development and class procedures, measurement and evaluation, kinesiology, exercise physiology, and motor development and learning. Students receive instruction in the techniques of coaching the various individual, dual, and team sports, and in adapting these activities to the needs of the handicapped. Because physical education overlaps the fields of health and recreation, Physical Education majors may take courses in these areas.

Areas of emphasis in Physical Education include Athletic Training, Dance, Adapted Physical Education, Sports Communication, Coaching, Gerontology, Cardiovascular Health and Exercise, Elementary School, and Secondary School. Class advisers are available to assist students as selections are made.

A View of the Five-Year Major The development and demonstration of personal skill in performance and teaching are an integral part of the teacher certification professional program. Each student is expected to demonstrate a competent level of knowledge and skill proficiency in swimming, gymnastics, track, badminton, tennis, rhythmic, volleyball, basketball, conditioning, dance, two team sports, and one individual sport. Skill may be demonstrated through competency testing or by taking the appropriate courses. Major students are assigned supervised student-teaching or field experiences in schools or agencies throughout the Greater Boston area as appropriate to their areas of concentration. In addition, students have the opportunity to increase their experience with children or adults through cooperative work assignments and in pre-practicum courses. Physical Education majors are expected to maintain a specific grade average in order to be retained in the curriculum. Required averages are listed for each class level in the current *Student Handbook*.

Clothing appropriate for physical activity classes is required. Fees may be assessed in courses requiring highly specialized equipment, supplies, or off-campus facilities. A one-week resident program at the Warren Center is required during the spring quarter of the freshman year, for which an additional room and board fee is charged.

Admissions Requirements Students desiring admission to degree programs in the Department of Physical Education must meet the entrance requirements of the University. In addition to transcripts indicating successful completion of a secondary school program, including courses in algebra and biology, applicants are required to submit scores from the Scholastic Aptitude Test (SAT) and three College Board Achievement Tests, preferably in areas related to their intended fields of study. Although not required, a personal interview with an admissions counselor is suggested.

Physical Education Nonteaching Options

With judicious use of general studies electives and some adjustment in the basic Physical Education curriculum, students may enroll in one of two nonteaching options in physical education—Cardiovascular Health and Exercise or Sports Communication. Preparation in the former is appropriate for those interested in working in health clubs or spas; stress-testing units; and adult fitness programs in YMCAs, YWCAs, or other private agencies; or as exercise specialists in corporate fitness training programs. The Sports Communication curriculum is appropriate for those interested in pursuing careers involving sports writing for magazines or newspapers or sports reporting via radio and television.

Program Accreditation

The professional program in Physical Education is accredited by the National Council for Accreditation for Teacher Education, the Interstate Certification Compact/National Association of State Directors of Teacher Education and Certification, and the National Athletic Trainers Association.

Certification

Upon successful completion of the Physical Education requirements for graduation, students are eligible to apply for Massachusetts Certification and to teach in Massachusetts public schools. Those who have completed the Athletic Training area of emphasis within the Physical Education curriculum are eligible to apply to the National Athletic Trainers Association to take the certification examination. Certification in Physical Education and/or Athletic Training does not guarantee a position.

All-University Electives in Physical Education

A broad selection of electives in dance, sports, games, aquatics, and gymnastics is offered for all University students. All classes are open to men or to women with instructional modifications where appropriate.

The elective program places focus on the lifetime use of sports, dance, and aquatics for recreational satisfaction and participation. Classes are subject to cancellation if enrollments are too low.

Dance Theatre

The Northeastern University Dance Theatre offers students interested in jazz or modern dance as a performing art the opportunity to choreograph and/or perform in concert. In addition to an annual University concert production, this group presents several lecture-demonstrations and/or community concerts each year. Admission is by audition.

Intramural and Extramural Sports

Students are provided a comprehensive program of intramural and extramural sports through clubs, leagues, and individual participation. Separate leagues are organized for commuting, dormitory, and fraternity students. Intramural sports are organized separately for men and women and, for certain activities, on a coeducational basis. Throughout the year, intramural and club participation may be possible in badminton, basketball, fencing, football, golf, gymnastics, modern and jazz dance, swimming, volleyball, water polo, and other sports. A "drop-in" program for individual leisure physical activity is also provided.

Basic Course Requirements

I. General Requirements for All Physical Education Freshmen (Year One)

Course	Q.H.	Course	Q.H.
English I & II	8	Current Issues in Health	4
Biology I	4	Human Movement	3
Biology II, Chemistry, or Physics	4	Life/Career Planning	3
Social Science I	4	Mathematics	4
History/Philosophy PE	3	First Aid	2
Track & Field	1	Group Dynamics	3
Swimming	1	Basketball	1
Gymnastics I	1	Gymnastics II	1
Volleyball	1	Human Development I	4

II. Upperclass Requirements for Teacher Certification Students (Years Two-Five)

Course	Q.H.	Course	Q.H.
Human Development II	4	Kinesiology I & II	8
Educational Statistics	4	Measurement and Evaluation	4
Psych. Elective (specified choices)	4	Exercise Physiology I	4
Anatomy and Physiology I & II	8	Theory of Coaching/Play	2
Adapted PE I	4	Elementary School Activities or	
Motor Development	4	Secondary School Activities	3
Motor Learning	4	Athletic Training	3
Critical Teaching Skills	4	Administration of PE	4
8 Prof. Skill Electives	8	Curricula Development	3
Boston-Bouvé Electives	9	Student Teaching	12
		4 Teaching, Analysis/Coaching Courses	8
		General Studies Electives	24

Graduation Requirement 180 Q.H.; 185 Q.H. for Athletic Training option

Curriculum may be altered because of changes in state certification regulations.

NOTE: Teaching options in Athletic Training, Adapted Physical Education, Sports Communications, Gerontology, Coaching, and Elementary or Secondary School are available with only minor adjustments to the above-listed curriculum.



 III. Professional Requirements for Nonteaching Option in Sports
 Communication (Years Two–Five)

Course	Q.H.	Course	Q.H.
Fundamentals of		Human Development II	4
Newswriting I & II	8	Kinesiology I & II	8
Techniques of Journalism I		Motor Development	4
& II	8	Motor Learning	4
Theories of Persuasion	4	Psychology Elective	
Grammar for Journalism		(specified choices)	4
(required only for those		Theory of Play	2
receiving below B in		Theory of Coaching	2
English II)		Athletic Training	3
Take as an elective		Educational Statistics	4
Elect at least one of the		Exercise Physiology	4
following:	4	Adapted Physical	
TV Newswriting		Education	4
Advanced Reporting		Psychology of Coaching &	
TV News Production		Sport	2
Magazine Writing		Administration of PE	4
Basic Photojournalism		Sociology of Sport	2
Layout and Make-up		Physical Education Activity	
Introduction to		Skills	2
Communication Skills		Coaching/Officiating	2
Business & Professional		Field Experience	12
Speaking		General Studies Electives	<u>20</u>
Interpersonal		Graduation Requirement	180
Communication I			
Interpersonal			
Communication II			
Anatomy-Physiology I &			
II	8		
BBC Electives	9		

NOTE: 9 Q.H. of BBC electives are required.

 IV. Professional Requirements for Nonteaching Option: Cardiovascular Health and Exercise Specialist (Years Two–Five)

Course	Q.H.	Course	Q.H.
Anatomy-Physiology I & II	8	Exercise Physiology	4
Kinesiology I & II	8	Cardiopulmonary Disease	4
Human Development II	4	Health Counseling	4
Chemistry I & II	8	Advanced Athletic Training	4
Basic Athletic Training	3	Exercise Testing and Prescription	3
Motor Learning	4	Electrocardiography	4
Motor Development	4	Nutrition	4
Statistics	4	General Electives	10
Psychology Elective (specified choices)	4	Administration of Recreation	4
Public Health	4	Budget Analysis	4
Clinical Athletic Training	2	Special Problems	4
Measurement & Evaluation	4	Field Experience	12
Introduction to Counseling	4	Physical Education Activity Skills: Swimming, Tennis, Conditioning, Badminton, and 7 Electives (these are in addition to the 6 first-year skills)	<u>11</u>
		Graduation Requirement	185

All program options in Physical Education, teaching or nonteaching, must be declared by the end of the sophomore year. Subsequent changes may result in an extended graduation date.



Physical Therapy Department

Christopher E. Bork, Ph.D., *Associate Professor and Chairman*

Professors

Elizabeth J. Fellows, M.A.
Whitney R. Powers, Ph.D.

Associate Professor

Ruth P. Hall, B.S.

Assistant Professors

Catherine M. E. Certo, M.S.
Janet L. Costa, M.S.
Joan S. Lydic, M.S.
Paul F. Mettler, M.S.
Dolores A. Price, B.S.
Ruth Rose-Jacobs, M.S.
Margaret L. Schenkman, Ph.D.
Pamela A. Stanton, M.S.

Instructors

George B. Coggeshall, M.S.
Nancy C. Gilberti, M.S.
Edward M. Quinn, M.S.

Clinical Supervisor/ Clinical Assistant Professor

Meredith E. Drench, M.Ed.

Professional Preparation

Aims The Department of Physical Therapy is dedicated to the preparation of therapists who can provide services of the highest quality in a time of changing concepts, new trends, and new challenges. Students will have the opportunities to acquire the skill to help patients gain functional independence and to learn to recognize and assist with emotional and socioeconomic problems that affect recovery.

Description of the Major Physical Therapy is one of the health professions contributing to the delivery of comprehensive health care. The physical therapist is highly skilled in evaluation procedures and in the planning and execution of treatment programs appropriate to a patient's condition or disabilities. Additional responsibilities may include health-care planning and community service.

Physical therapists are employed in institutions such as general hospitals, children's hospitals, university hospitals, rehabilitation centers, schools or centers for crippled children, nursing homes, extended-care facilities, and community, state, and federal agencies. Private practice is another option chosen by physical therapists. In addition, there are increasing opportunities in teaching and research in physical therapy.

A View of the Five-Year Major The five-year program in Physical Therapy, based on the cooperative plan, is unique in physical therapy education.

The program of study integrates liberal arts and sciences and professional courses, with major emphasis on liberal arts in the first two years of the program and on professional preparation in the last three years. The professional courses include such subjects as anatomy, kinesiology, pathology, clinical medicine, neurology, orthopedics, physiology, physical therapy procedures, and administration, as well as clinical experience in various hospitals and clinics.

Lecturers from Tufts University School of Medicine and the New England Medical Center Hospitals, as well as from medical and social agencies in the Boston area, augment the professional staff in the Physical Therapy program.

Supervised clinical education is a strong component of the curriculum and a requirement for graduation. Clinical experience provides the student with opportunities to practice various phases of physical therapy under supervision in preparation for qualifying as a physical therapist. Assignments in clinical education are not confined to the Boston area. They may include physical therapy departments throughout the country, particularly in many states along the eastern seaboard.

Students admitted to the Department of Physical Therapy must maintain acceptable standards of scholarship and performance in the prescribed program. They must also demonstrate good health, verbal fluency, essential motor skills, and emotional maturity; they must complete all required courses and have favorable evaluations from clinical education and co-op experience. To continue in the program, students are required to maintain a grade of C or better in all professional courses.

All students interested in majoring in physical therapy should contact the Department of Physical Therapy for information regarding departmental academic policies and procedures.

Clinical Education Students on clinical education assignments should plan on additional expenses, including travel.

Sample Freshman-Year Program of Studies in Physical Therapy

First Quarter

Foundations of Psychology I
Fundamentals of Mathematics
Basic Animal Biology
Health Education
First Aid

Third Quarter

General Chemistry
Basic Animal Biology
English

Second Quarter

Fundamentals of Mathematics
General Chemistry
English
Introduction to Physical Therapy

In addition to the above courses, students may elect to take Basic ROTC.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Fundamentals of Mathematics*	8	Basic Physics†	9
Basic Animal Biology*	8	Human Physiology†	8
English*	8	Human Anatomy†	4
General Chemistry*	10	Foundations of Psychology I*	4
Current Issues in Health*	4	4 General Electives	16
First Aid	2	Foundations of Psychology II†	4

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Introduction to Physical Therapy*	2	Advanced Therapeutic Exercise	4
Introduction to Physical Therapy†	2	Neuroanatomy	5
Perceptual and Motor Learning†	3	Integration of Therapeutic Exercise	2
Clinical Gross Anatomy	6	Electrical Testing and Treatment Procedures	2
Physiology for Physical Therapists	3	Research Design	4
Massage	2	Psychosocial Aspects of Illness	3
Clinical Medicine I, II, III	10	Physical Therapy in the Health-Care System	3
Clinical Psychiatry	2	Supervised Clinical Education	5
Clinical Kinesiology	4	Clinical Seminar	2
Basic Therapeutic Exercise	4	Administration	3
Evaluation Procedures	3	Investigative Studies	6
Prosthetics/Orthotics and Functional Activities	3	Graduation Requirement	170
Management of Medical/Surgical Respiratory Disorders	2		

*These courses are usually taken in the freshman year.

†These courses are usually taken in the sophomore year.



Department of Recreation and Leisure Studies

George R. Atkinson, Ed.D., *Assistant Professor and Acting Chairman*

Professor

Peter J. Graham, Ed.D.

Associate Professors

Elaine G. Eliopoulos, Ed.D.

Richard B. Morrison, Ed.D.

Frank M. Robinson, M.S.

Assistant Professors

John W. Shank, M.S.

Patricia A. Shank, M.S.

James C. Shuman, Ed.D.

Professional Preparation

Aims Recreation is a vital profession in this rapidly changing world. A major in Recreation and Leisure Studies offers diversified curricular opportunities and multiple career options for graduates. As societal changes reflect a balance of work, education, and leisure, the Recreation and Leisure Studies program prepares students to guide others in the integration, planning, and sorting out of changes throughout their life span and to manage recreation agencies in a variety of leisure service settings.

Description of the Major The curriculum provides an opportunity for students to select from one of three flexible professional career areas of concentration: Recreation Management, Therapeutic Recreation, and Outdoor Recreation/Environmental Education. The Recreation Management concentration is designed to provide students with the knowledge and skills that will enable them to pursue positions in commercial recreation and tourism; planning firms, management organizations; federal, state, and local public agencies; consulting firms; health and fitness centers; and private agencies. The Therapeutic Recreation concentration is designed to equip students with the professional job skills that are essential to work with disabled people in institutions and community-based settings, including hospitals, rehabilitation facilities, nursing homes, schools, and residential centers as well as day-care vocational/avocational centers and in therapy collaboratives. Students with an emphasis in Outdoor Recreation/Environmental Education have an opportunity to pursue positions as interpreters, park rangers, resource recreation managers and planners, conservationists, and environmental impact specialists.

A View of the Five-Year Major The cooperative program of study is based in the liberal arts and sciences, with courses in professional education beginning in the freshman year. All students take a common department core of courses and professional skills that complement one of three areas of concentration.

An internship in a selected recreation and leisure service setting provides both an exciting and practical opportunity for students to gain professional, career-level work experience. In addition, the cooperative plan offers an opportunity for practical, on-the-job experience in youth agencies, municipal recreation departments, private recreation agencies, hospitals and institutions, nursing homes, commercial recreation and tourism organizations, and many more selected settings.

A variety of experiential education opportunities supplementing regular course offerings is available at the Warren Center of Northeastern University, a unique teaching-learning laboratory within easy commuting distance of Boston, and through the summer wilderness program.

Special Requirements

Students are scheduled for their one-week resident camp experience at the close of the freshman year at the Warren Center in Ashland, approximately 25 miles west of the Boston Campus. The lab fee for this experience is approximately \$160 per student.

Sample Freshman-Year Program of Studies in Recreation and Leisure Studies

First Quarter

English
Speech Fundamentals
Social Science
Life Career Planning

Third Quarter

Basic Biology
Current Issues in Health
Social Science
Recreation Skills

Second Quarter

Basic Biology
English
Social Science
Foundation of Leadership in
Leisure Services

One-Week Camp Experience

Basic Course Requirements (172 Q.H. are required for graduation)

I. General Requirements (83 Q.H.)

Course	Q.H.	Course	Q.H.
Biology	8	Earth Science electives	8
English	8	Anatomy and Physiology	8
Social Science	12	Free Electives	24
Speech Fundamentals	3		
Current Issues in Health	4		
Human Development	8		

II. Professional Core Requirements for All Students (59 Q.H.)

Course	Q.H.	Course	Q.H.
Life/Career Planning	4	Foundations of Leadership in Leisure Services	4
Intro. to Recreation and Leisure	3	Dept./Univ. Skill electives	12
Research	8	Internship Seminar	1
Program Planning	4	Internship in Recreation	16
Group Dynamics	3	Senior Seminar	4

 III. Professional Requirements for Recreation Management
 Concentration (32 Q.H.)

Course	Q.H.
Budget Analysis	4
Elements of Outdoor Recreation Planning	4
Administration of Recreation and Parks	4
Program Evaluation	4
Professional Electives	16

 IV. Professional Requirements for Therapeutic Recreation
 Concentration (32 Q.H.)

Course	Q.H.	Course	Q.H.
Social and Psychological Impacts of Disabilities	4	Overview of Physical Disabilities	4
Foundations of Psychiatric Service in Therapeutic Recreation	4	Program Planning in Therapeutic Recreation	4
		Process of Aging	3
		Professional Electives	13

 V. Professional Requirements for Outdoor Recreation/Environmental
 Education Concentration (32 Q.H.)

Course	Q.H.	Course	Q.H.
Environmental Education	4	Elements of Outdoor Recreation Planning	4
Seminar on Environmental Issues and Legislation	4	Survey of Recreation Facilities	3
Interpretation of Ecological and Social History	4	Professional Electives	13

 VI. Professional Electives

Course	Q.H.	Course	Q.H.
Sports Leadership	2	Leisure and the	
Survey of Aquatics	2	Community School	4
Introduction to Winter		Leisure Counseling	4
Skills	1	Urban Recreation	4
Survey of Recreation		Therapeutic Recreation	
Facilities	3	with Developmentally	
Basic Sailing	2	Disabled Persons	4
Tripping and Orienteering	2	Basic Canoeing	2
Winter Sports	2	Commercial Recreation	4
Camp Administration	3		
Outdoor Education for the			
Handicapped	3		
Basic Rockclimbing and			
Rappelling	2		
Leisure and Lifestyles	4		
Concepts of Leisure:			
Sociopsychological			
Perspectives	4		
Leadership and			
Organization of			
Wilderness Recreation	4		
Arts and Crafts for Leisure	4		

School and Community Health Education Department

George R. Atkinson, Ed.D., *Assistant Professor and Acting Chairman*

Professor

H. Marie Garrity, Ed.D.

Adjunct Professor

Elizabeth A. Neilson, Ed.D.

Assistant Professor

Ann M. Downey, Ph.D.

Professional Preparation

Aims Health Education is a relatively new profession concerned with the improvement of individual and community health status through educational activities. While working in a variety of settings such as volunteer health agencies, public health clinics, elementary and secondary schools, or health-planning organizations, the health educator facilitates health-promoting behavior changes as a means to enriching the quality of life. The health educator uses techniques and information from both medical and educational fields in order to assist individuals and communities dealing with emotional, physical, or social aspects of health.

Description of the Major Since health has psychological, physical, and social components, the program of study is organized to help students develop an understanding of each of these as well as their interaction. Course study during the first part of the program emphasizes the foundations of health education in the social and life sciences. Practical experience in health education is included throughout the program to provide the student an opportunity to apply theory and techniques with Boston-area groups. Major courses on contemporary health issues help prepare the student to understand details and complexities of several important health topics. Educational issues and approaches are included in courses to help students understand the role of education in improving health.

Overall, the program of study is intended to produce graduates with the competence to diagnose the health education needs of groups and to develop, organize, and evaluate effective educational activities.

The undergraduate program in Health Education offers students, through the Cooperative Plan of Education, the opportunity to graduate with more than a year's work experience in the field. Through placements with health or educational organizations in the Boston area, students can also finance part of their education while gaining on-the-job work experience.

Although individual health status is determined by genetics, environment, diet, and behavior, current research indicates that behavior is the determinant most likely to influence further improvements in the health of individuals. Health education is directed primarily at health behaviors in order to prevent health problems and to promote health. Throughout the program of study, the concepts of prevention, health promotion, wellness, and holistic health serve as common threads in professional preparation. The development of specific competencies for health education roles is an objective in each of the Department program requirements.

College and University Services

The Department of School and Community Health Education is interested in the health status of the University community. In an attempt to meet the health needs of students, several elective courses are offered regularly on selected health issues of potential personal and professional interest to any University student. Courses on topics such as stress and health, nutrition, sexuality, mental health, consumer health, drug use/abuse, and aging are designed to provide current information and concepts related to wellness and health promotion. Instruction is organized into lectures, discussion groups, and demonstrations to provide students the opportunity to understand the significance and application of recent health-related research findings in their own lives.

Program Accreditation

The professional program in School Health Education is accredited by the National Council for Accreditation of Teacher Education and is approved under the Interstate Certification Compact. Although there are no official accreditation standards for Community Health Education programs in the United States, the Northeastern program is based upon professional preparation guidelines widely accepted in the field of health education.

Certification

Upon successful completion of the requirements for graduation in Health Education, students in School Health Education are eligible to apply for Massachusetts Certification and to teach in the public schools of Massachusetts. Certification is also readily obtained in other states having certification reciprocity agreements with the Massachusetts Department of Education. There are no certification criteria for students in Community Health Education. However, all students must satisfy departmental requirements before being approved for graduation in School and/or Community Health Education.

Sample Freshman-Year Program of Studies in School and Community Health Education

First Quarter

General Chemistry
English
Education and Social Science
Current Issues in Health
First Aid

Second Quarter

General Chemistry
Biology
Education and Social Science
Elective
Instructional Resources
Introduction to Safety
Foundations of Health Education

Third Quarter

Health Concerns of Youth
Biology
English
Mathematics or General Studies
Elective
Physical Education

Basic Course Requirements

I. General and Professionally Related Requirements

Course	Q.H.	Course	Q.H.
General Chemistry*	8	Social Science*	8
English*	8	Human Development†	8
Biology*	8	Measurement and Evaluation	4
Microbiology	4	Introduction to Special Education	4
Mathematics*	4	Humanistic Foundations	4
Psychology	8	Physical Education	2
Anthropology	4	General Studies Electives	20
Anatomy and Physiology	8		

*Courses are usually taken in the freshman year.

†Courses are usually taken in the sophomore year.

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Foundations of Health Education*	2	Community Health Organization and Administration of School and Community Health Education	4
Human Sexuality/Family Drug Use and Abuse	4	First Aid*	2
Mental Health	4	Instructional Resources*	2
Nutrition	4	Health Concerns of Youth*	4
Seminar in Health Education	4	Concepts in Health, Aging and Longevity	4
Health Counseling	4	Practicum in School Health or Practicum in Community Health	12
Teaching Procedures/ Curriculum		Analysis of Teaching	4
Health Education for School and Community Communicable/ Degenerative Diseases	4		
Introduction to Safety*	2		
Current Issues in Health*	4		

*Courses are usually taken in the freshman year.



Speech-Language Pathology and Audiology Department

Robert B. Redden, Ed.D., *Associate Professor and Acting Chairman*

Professor

Robert J. Ferullo, Ed.D.

Associate Professors

Mary Florentine, Ph.D.

Arlene T. Greenstein, Ph.D.

Assistant Professor

F. Adele Proctor, Sc.D.

Clinical Supervisor/

Clinical Assistant Professor

Helen Anis, M.A.

Clinical Supervisors/

Clinical Instructors

Nilda M. Collazo, M.S.

Judith M. Goldstein, M.A.

Susan Ross-Abrahamson, Ed.D.

Rose Laurie Schloff, M.S.

Victoria M. Silberstein, M.A.

Professional Preparation

Students in the Speech and Hearing major pursue scientific study of the processes of individual human communication. Particular emphasis is placed on speech, language, and hearing.

Aims To achieve a minimum level of clinical competence as a speech-language pathologist or audiologist, students are required to undertake study at the master's degree level. This major seeks to prepare students for professional graduate study and subsequent application for membership in and certification by the American Speech-Language-Hearing Association.

Description of the Major Preprofessional preparation involves a specialized academic experience that provides study of the normal communication processes, the development and disorders thereof; evaluation procedures; and clinical techniques. The emphasis of this major is on the normal processes of communication.

A View of the Five-Year Concentration College and general education requirements include elementary courses in psychology, sociology, anatomy, statistics, education, mathematics, and science.

Required studies of the normal communication processes cover the normal development and use of speech-language and hearing with an emphasis on the normal aspects of human communication. Content areas are 1) anatomic and physiologic bases, such as neurology, anatomy, and physiology of speech, language, and hearing mechanisms; 2) physical bases and processes of the perception and production of speech and hearing, e.g., acoustics (or physics of sound), phonology, physiologic and acoustic phonetics, and perceptual processes; and 3) linguistics, sociolinguistics, and psycholinguistics.

Basic Course Requirements

I. General Requirements for All Students

Course	Q.H.	Course	Q.H.
English I & II	8	Personality	8
Human Organism	4	Electives*	44
Education & Social Science	4	Abnormal Psychology	8
Human Development I	4	Electives	28
Intro. to Educational Statistics	4		

**These electives must include 8 Q.H. in Educational Sociology, 4 Q.H. in Educational Psychology, 16 Q.H. in Liberal Arts Humanities, 4 Q.H. in Liberal Arts Social Science, 4 Q.H. in Education, 8 Q.H. in Liberal Arts Math/Science.*

II. Preprofessional Major Requirements

Course	Q.H.	Course	Q.H.
Intro. to Speech and Hearing	4	Fundamental Reading	4
Basic Manual Communication	4	Professional Development	1
Anatomy & Vocal Mechanism	4	Diagnostic Techniques	4
Intro. to Special Education	4	Orientation to Clinical Practice	4
Developmental Semantics & Syntax	4	Phonemic Disorders	4
Speech Science	4	Developmental Phonology	4
Intro. to Audiology	4	Hearing Science	4
Fluency Disorders	4	Clinical Practice	8

III. Sample Freshman-Year Program of Studies for All Majors in Speech and Hearing

First Quarter

English I
Education and Social Science
Human Organism
Elective*

Second Quarter

English II
Basic Manual Communication
Elective*
Elective*

Third Quarter

Introduction to Speech & Hearing
Elective*
Elective*
Elective*

**Freshmen are encouraged to consult with their departmental advisers in choosing these electives.*

During the junior and senior years the student pursues beginning courses in understanding speech-language and hearing disorders; evaluation skills, such as procedures, techniques, and instrumentation used to assess communication disorders; and management procedures, such as principles in therapy.

During the senior year students perform supervised introductory clinical practice in a school setting. The focus is on remediation, not on classroom teaching.

The Speech-Language-Hearing Clinic is an on-campus facility that is utilized for the delivery of clinical services. Students observe via one-way windows and closed-circuit television monitors. The clinic is approved by the Professional Services Board of the American Speech-Language-Hearing Association.

The Speech Communication Research Laboratory is a facility within the Department wherein students obtain laboratory experiences in Audiology and Speech.

NUSSHA (Northeastern University Student Speech and Hearing Association) sponsors professional speakers, films, videotapes, and social activities.

Program Accreditation

The Education and Training Board of the American Speech-Language-Hearing Association accredits graduate programs only. The graduate program at Northeastern is accredited.

The preprofessional program is accredited by the National Council for Accreditation of Teacher Education.

Certification

Following completion of the master's degree, the graduate must pass a national examination in Speech-Language Pathology or Audiology and complete a Clinical Fellowship Year, which is nine months of supervised clinical experience.

Human Services

An interdisciplinary major involving the Boston-Bouvé College of Human Development Professions and the College of Arts and Sciences

Advisers

John D. Herzog, Ph.D., *Foundations of Education*
 Wilfred E. Holton, Ph.D., *Sociology/Anthropology*
 Ronald J. McAllister, Ph.D., *Sociology/Anthropology*
 Harold S. Zamansky, Ph.D., *Psychology*

Fieldwork Supervisor

Natalie H. Riffin, M.Ed., O.T.R.

Professional Preparation

Aims This major offers students the opportunity to prepare themselves for possible careers in one of the areas broadly defined as "human services." The program is interdisciplinary. The Human Services curriculum allows students to obtain the fundamental attitudes, knowledge, and skills that can lead to a meaningful career in the helping professions as well as to a graduate education in a variety of fields.

Students who major in Human Services prepare themselves to perform a variety of functions in public and private agencies. Through course work, two quarters of fieldwork experience, and possible co-op jobs, students have the opportunity to explore such areas as casework services in social service and welfare agencies; therapeutic treatment programs in mental health settings; supportive counseling in community health centers; rehabilitation counseling services; sheltered workshops; parole counseling; court liaison in programs for delinquent youth; staff work in halfway houses, penal institutions, and drug treatment centers; supportive counseling for the mentally retarded; community organizing; services for the aging; administration in human services agencies; and social program research and evaluation.

Description of the Major The five basic aspects of this program beyond the college requirements are:

I. Prerequisite Courses—Courses in the areas of sociology, psychology, economics, government, and human services.

II. Core Courses—Courses in the areas of statistics, research methods, personality and abnormal psychology, social structure, group process, human services organizations, and intervention strategies.

III. Specified Electives—Three courses in poverty, minority affairs, and/or special needs.

IV. Specializations—Five courses that focus on a student's area of interest and selected in consultation with an adviser.

V. Supervised Field Experience—During the junior and senior years, students spend 300 hours in a supervised placement in a public or private agency, usually in separate experiences of 150 hours each.

A View of the Five-Year Major The Human Services major offers students the opportunity to obtain useful values and basic knowledge relating to various human services fields. Courses introducing some basic skills can help them to understand and work with a variety of helping services.

Human Services students at Northeastern have been very active in their major and helpful to each other. The Human Services Student Organization combines social and career-related activities, which in the past have included open houses, day-long conferences, and weekend retreats. A quarterly *Human Services Newsletter* is published by students and faculty.

College of Business Administration

Philip R. McDonald, D.B.A., *Dean*
Thomas E. Moore, M.B.A., *Associate Dean*
Barbara W. Reitz, M.B.A., *Assistant Dean*
Christine Chevoor, A.B., *Assistant to the Dean, External Relations*
Maryann G. Billington, M.B.A., *Assistant Dean (Graduate School)*
Dennis Ramsier, M.B.A., *Assistant Dean (Undergraduate Program)*
Peter J. Gargano, B.A., *Administrative Assistant*

Accounting Group

Professors

Ronald M. Copeland, Ph.D.,
Lillian L. and Harry A. Cowan
Research Professor of
Accounting
Joseph R. Curran, Ph.D.
Joseph M. Golemme, M.A.
C.P.A., Director, Graduate
School of Professional
Accounting (Harold A. Mock
Professor of Accounting)
Russell W. Olive, D.B.A.

Associate Professors

Robert J. Hehre, D.B.A.
Paul A. Janell, Ph.D.
Richard Lindhe, Ph.D.
Daniel C. Scioletti, J.D.

Assistant Professors

Ira S. Greenberg, M.B.A.
Hassanali Espahbodi, Ph.D.
Richard L. Keith, M.B.A.
Lynn Marples, M.B.A.
Sharon M. McKinnon, Ph.D.
Stephen Tomczyk, D.B.A.
James F. Volkert, Ph.D.

Lecturers

Alvin M. Black, C.P.A. (Visiting)
Hugh Crossland, L.L.M.
James F. McDermott, M.B.A.,
C.P.A.
Peggy L. O'Kelly, M.B.A., C.P.A.
Jonathan Pond, M.B.A., C.M.A.
John R. Schryver, M.S.

Finance and Insurance Group

Professors

Elliott L. Atamian, D.B.A.
Wesley W. Marple, D.B.A.
Edward R. Willett, Ph.D.

Associate Professors

Lal C. Chugh, Ph.D.
John C. Edmunds, D.B.A.
Gerald P. Madden, Ph.D.
Joseph W. Meador, Ph.D.
Jonathan B. Welch, Ph.D.

Assistant Professors

Stephen A. Kursh, Ph.D.
Stephen Marder, Ph.D.
Donald G. Margotta, M.B.A.
Coleen C. Pantalone, Ph.D.
Harlan D. Platt, Ph.D.

Lecturers

Kenneth M. Deitch, Ph.D.
(Visiting)
James A. Hart, Ph.D.
David N. Leggett, M.Acct.,
C.P.A.

General Management Group

Professors

Geoffrey P. E. Clarkson, Ph.D.
Carlo E. Gubellini, M.B.A.
Lyman A. Keith, M.B.A.
Robert C. Lieb, D.B.A.
David J. McCarthy, D.B.A.

Associate Professors

John Diffenbach, D.B.A.
Angelo J. Fiumara, J.D.
Robert H. Ketchum, Ph.D.
Raymond M. Kinnunen, D.B.A.
James F. Molloy, Ph.D.
David Silverstein, M.A.L.D., J.D.

Assistant Professors

Ellen Foster Curtis, D.B.A.
Ali R. Malekzadeh, Ph.D.
Ravi Ramamurti, Ph.D.
Ravi Sarathy, Ph.D.
William Tiga Tita, Ph.D.
Heidi V. Wortzel, Ph.D.

Lecturer

Joseph Chevarley, M.P.A.



Adjunct Professor

Milton C. Lauenstein, M.B.A.

Human Resources Group

Professors

Richard B. Higgins, Ph.D.
Jeffrey Timmons, D.B.A.

Associate Professors

David P. Boyd, Ph.D.
Christine L. Hobart, D.B.A.
Ralph Katz, Ph.D.
Andre P. Priem, M.A.
Francis C. Spital, Ph.D.
Edward G. Wertheim, Ph.D.

Assistant Professors

Rae Andre, Ph.D.
David B. Balkin, Ph.D.
Brendan D. Bannister, B.A.
Thomas M. Begley, Ph.D.
Henry M. Frechette, Ph.D.
Timm L. Kainen, Ph.D.
Mark P. Kriger, D.B.A.
Paulette A. McCarty, Ph.D.
Edward F. McDonough III, Ph.D.
William C. Ronco, Ph.D.
Bert A. Spector, Ph.D.

Management Science Group

Professor

Michael J. Maggard, Ph.D.

Associate Professors

R. Balachandra, Ph.D.
Steven E. Eriksen, Ph.D.
Shlomo Globerson, Ph.D.
(Visiting)

Victor B. Godin, D.B.A.
Robert A. Miller, Ph.D.
Carl W. Nelson, Ph.D.
Robert A. Parsons, M.B.A.
Mustafa R. Yilmaz, Ph.D.

Assistant Professors

Jonathan F. Bard, D.Sc.
Peter J. Bunting, Ph.D.
Edward G. Cale, D.B.A.
Sangit Chatterjee, Ph.D.
Kathleen Foley Currey, D.B.A.
Nancy Jo Klein Delaney, Ph.D.

William L. Huth, Ph.D.
Stephen K. Kwan, Ph.D.
Allen S. Lee, Ph.D.
Robert Mefford, M.A.
Paul M. Morris, Ph.D.
Marjorie Platt, Ph.D.
Marius M. Solomon, M.S.
Erland V. Sorensen, M.B.A.

Lecturer

Katherine Taylor Halvorsen, M.S.

Marketing Group

Professors

Charles J. Collazzo, Jr., Ph.D.
Philip McDonald, D.B.A.
Robert J. Minichiello, D.B.A.
Frederick Wiseman, Ph.D.
Jehiel Zif, Ph.D. (Visiting)

Associate Professors

Dan T. Dunn, D.B.A.
Thurston Graden, Ph.D.
Anil M. Pandya, Ph.D. (Visiting)
Edward T. Popper, D.B.A.
Samuel Rabino, Ph.D.
Robert F. Young, D.B.A.

Assistant Professors

Terry F. Allen, M.B.A.
Kristina Cannon-Bonventre,
Ph.D.
Vaughn D. Roller, M.B.A.
Robert M. Schindler, Ph.D.

Lecturer

Hyman Dushman, M.B.A.

Center for Management Development

Richard J. Santos, M.S.
Associate Dean and Director
John J. Leary, Jr., M.B.A.,
Associate Director
Eric A. Wheeler, M.B.A.,
Associate Director

Professional Preparation

The College of Business Administration offers concentrations in the principal fields of business: Accounting, Entrepreneurship and New Venture Management (Small Business Management), Finance and Insurance, Human Resources Management, International Business, Management, Marketing, and Transportation and Physical Distribution Management. There is also a provision for those students who wish to design their own concentrations.

These programs are designed for men and women seeking to prepare themselves for managerial responsibility in business, government, and other organizations with the goal of developing the ability to recognize and solve problems and to understand the role of the business firm in the community, the nation, and the world.

In developing these skills, the students have the opportunity to gain not only a broad understanding of business and organizational problems through specialized courses, but also firsthand knowledge of effective solutions. Forty to sixty percent of the course work in the College of Business Administration concentrations is centered outside business to ensure a liberal education.

All concentrations are offered only on the five-year Cooperative Plan, providing most students with substantial practical experience, usually in the fields for which they are preparing.

Aims In keeping with the current trends in collegiate education, the College has adopted the following educational aims:

1. To develop attitudes and ideals that are ethically sound and socially desirable.
2. To cultivate an awareness of the social, political, and economic developments to which the business firm must adapt.
3. To develop the habits of accurate thinking that are essential to sound judgment and the habits of accurate expression that are essential to effective communication.
4. To provide an opportunity for students to develop a specialization in business in accordance with their interests and talents.

A View of the Five-Year Program The College of Business Administration offers a Bachelor of Science in Business Administration degree and has concentrations of courses in several areas. The College combines its business curriculum with courses from the sciences, humanities, and social sciences. Students must take courses in these areas to ensure a well-rounded background so valuable in the business world.

All students in the College are required to complete, in addition to their academic courses, the program of cooperative education. This program gives the student the opportunity to challenge and reinforce in the work place the theories and techniques learned in the classroom. In a similar way, the "well, that's the way they do it in my co-op company" attitudes can be and are questioned in the classroom. This double-faceted approach enhances the whole education process and generally produces graduates with a more realistic understanding of the work place. Cooperative work assignments generally are full-time, professional positions with organizations both in the profit and not-for-profit private sector and in government. Work assignments are for six months of each year above the freshman level.

After the foundation-laying and tools-oriented course work (combined with a large number of nonbusiness courses) of the first two years, the final three years emphasize the various functional areas of business and require students to concentrate their studies in specific areas. (Detailed descriptions of these areas follows this section.) In most of these upper-division courses the traditional lecture-and-recitation format is supplemented by problem-solving and case-study methods. Using these, students analyze actual businesses and business problems and present recommendations for possible solutions. Students are encouraged to develop the ability to think independently, to support ideas with fact and logic, and to analyze and challenge propositions. The added experience of co-op work assignments, when combined with course work, offers each student practical exposure to the responsibilities of various administrative positions as well help in determining the kind of organization in which he or she would like to work. Special classrooms have been designed for the College to facilitate the case method of instruction.

During the 1980s, the outlook for exciting careers in Business Administration is optimistic. The challenges that business faces from the effects of foreign policy, high technology, affirmative-action regulations, and new economic policies tend to create a demand for highly trained individuals equipped to analyze the complex problems of modern-day economy.

Upon completion of the Bachelor of Science in Business Administration degree, the graduate may choose to enter the work force (many former students have assumed full-time positions with former co-op employers) or go on to pursue higher degrees.

In general, students find that graduate schools view a B.S. degree in Business as solid preparation for graduate work, not only in business but also in public administration, health-care administration, and education administration. Law schools look favorably on the prelegal background obtained in business school. Although the Association of American Law Schools does not recommend particular courses or curricula for prelegal students, it does advise undergraduates to develop critical understanding of the institutions and values with which the law deals. Many careers in law are directly involved in the business world, either in large corporations or in private practice.

The College's curriculum offers students the opportunity to develop a broad understanding of the business environment, as well as to acquire the specific skills necessary to manage organizations in today's complex social and legal environment.

Honors Program

A place in the Honors Program of the College is extended to juniors and seniors who, at the end of the first quarter of their middler year, rank in the top ten percent of the class. These students are given preference in obtaining entrance to any of the College's honors seminars. They may also participate in a Senior Honors Thesis Project, an independent research project under the careful supervision and direction of a faculty member.

The Honors Program was incorporated to

- provide opportunities to bring together the best students and faculty in stimulating courses and other academic activities,
- increase the knowledge and professional skills of outstanding students,

- enhance the employment or further educational objectives of gifted students,
- develop increased respect in academic and professional communities for the College's students and programs, and
- facilitate course and curriculum experimentation into new and uncharted areas.

Any Honors Program student who completes twelve quarter hours of honors-level work at a B average or higher will receive special recognition of this achievement on both the diploma and the transcript.

Business Administration as a Minor Course of Study

The College of Business Administration faculty, realizing that many students may have an interest in business yet major in other disciplines, offers a Minor in Business Administration. The College of Arts and Sciences, which teaches some of the courses, collaborated in the design of the minor.

The program has been designed so that students who complete the minor will gain a background in disciplines that serve as foundation courses for the study of business and an exposure to its various functional areas. In addition there is an exploration of the relationship between business and society and the obligations of each to the other.

Students of the Basic Colleges other than Business Administration may find the minor particularly attractive if they are considering a career in business and/or are contemplating enrolling in an MBA program, but are not sure what is involved in the study of business. Qualified students who have completed the five background and methodology courses apply for formal admission to the minor after they have accumulated eighty or more quarter hours of credit. Entry into the minor can be effected in either the fall or winter quarters.

Program Components

Background and Methodology: completed prior to formal entry into the minor

Course	Q.H.
College Algebra	4
Macroeconomics	4
Microeconomics	4
Descriptive Statistics	4
Inferential Statistics	4
	<hr/> 20

 Business Functions

Course	Q.H.
Introduction to Business	4
Introduction to Accounting	4
Organizational Behavior	4
Introduction to Finance	4
Introduction to Marketing	4
Operations Management	<u>4</u>
	24

 Business and Its Environment

Course	Q.H.
One course from the approved list	4

After a student has completed all program components, the College of Business Administration will so notify the student's Basic College so that appropriate recognition can be made.

Graduation Requirements

Candidates for the Bachelor of Science degree must complete all of the prescribed work of the curriculum in which they seek to qualify. This presently totals 176 quarter hours of credit. The degree conferred not only represents the formal completion of selected courses of study, but also indicates professional study in the designated area of concentration. An overall average grade of C and a C average in required courses are necessary for graduation.

Students must be enrolled in a full program of studies in the College of Business Administration during the final three quarters immediately preceding graduation.

Graduation with Honors Candidates who have achieved superior grades in their academic work will be graduated with honor. Upon special vote of the faculty, a limited number of this group may be graduated with high honor or with highest honor. Students must have been in full-time attendance in the Basic Colleges of the University at least six quarters before they can become eligible for honors at graduation.

Accreditation

The undergraduate program of the College of Business Administration is fully accredited by the American Assembly of Collegiate Schools of Business, indicating that the program meets the accrediting agency's standards for faculty and student quality, curriculum design, and overall University support.

Curriculum

The following sample freshman-year program and the basic course requirements for the College of Business Administration are the same for all concentration areas.

Sample Freshman-Year Program of Studies in the College of Business Administration

First Quarter

Introduction to Business
Fundamentals of Math
Non-Business Elective
Economics (Macro)

Second Quarter

Accounting I
Quantitative Methods in Business
English Composition
Non-Business Elective

Third Quarter

Accounting II
English Literature
Non-Business Elective
Economics (Micro)

Students who will complete the Reserve Officers' Training Corps program are permitted to drop one elective each quarter of their senior year. Individual ROTC courses carry no credit toward graduation.

The College of Business Administration has no physical education requirement. Students wishing to take courses in physical education may take a maximum of eight quarter hours as elective credits.

Basic Course Requirements

Course	Q.H.	Course	Q.H.
Fundamentals of Math	4	Introduction to Marketing	4
Quantitative Methods in Business	4	Statistics I & II	8
English	8	Introduction to Data Processing	4
Introduction to Business	4	Organizational Behavior	4
Accounting I & II	8	Complex Organizations	4
Economics (Macro)	4	Operations Management	4
Economics (Micro)	4	Business and Society	4
Introduction to Finance	4	Business Policy	4
		Non-Business Electives*	44
		Open electives	32

**For International Business majors: 8 Q.H. of this total must be from the international list.*

Accounting Concentration

Professional Preparation

Aims If you are anticipating a career in accounting, your interests probably lie within one of its two major areas: industrial accounting or public accounting. To enable you to obtain some of the professional background necessary to enter these fields, the College of Business Administration offers a variety of financial accounting and managerial accounting courses.

Preparation for a career in accounting encompasses a broad range of activities. These include all phases of record keeping, internal and external reporting, financial planning, cost control, the design and installation of systems and procedures, the application of electronic and other modern business methods to these activities, and managerial decision making.

Accounting is a fast-growing and critical area of business. It is an exacting field that requires men and women who enjoy dealing with facts and figures as well as with people. It requires accuracy and an ability to reason and to interpret business data.

A View of the Five-Year Concentration During your first two years, you will have the opportunity to develop communicative and analytical abilities, to gain an understanding of the nature of accounting, and to survey business as a dynamic institution in an economic setting. Another important activity will be consultation with your coordinator from the Department of Cooperative Education about future work assignments.

Subjects in your third year will include courses in the various functional areas of business (marketing, finance, operations, personnel), statistical analyses, and economic activity.

Whether your choice of employment is in the industrial accounting or public accounting area, you will have the opportunity to prepare through specialized courses in your third and subsequent years. Subjects will include cost accounting, accounting theory, planning and control, auditing, and taxes.

In addition to the sample freshman-year program and basic course requirements listed on page 139, students who concentrate in accounting are required to take the following courses:

II. Professional Requirements

Course	Q.H.
Intermediate Accounting I, II, & III	12
Cost Accounting I & II	8
Accounting Theory and Practice or Accounting Planning and Control	4

Entrepreneurship and New Venture Management Concentration

Professional Preparation

Aims The concentration in Entrepreneurship and New Venture Management (Small Business Management) offers students who plan to operate their own businesses an opportunity to develop skills necessary for the effective management of small enterprises.

Description of the Concentration Have you ever thought about starting, acquiring, and operating your own business? Will you be faced with an opportunity to join a family business upon graduation? Have your views of or experience with large corporations made you think about life in a smaller organization? Or do you think you would get a real kick out of working for a small company and wish to learn more about opportunities with smaller firms?

Are you considering a career in sales management, banking, public accounting, management consulting, or other areas that may involve you directly with owners and managers of new and small companies? For example, a bank loan officer, sales manager, or CPA would often have many entrepreneurs and small-company officers as clients.

If your answer to any of these questions is yes, then you are probably a member of a unique and growing portion of Northeastern students and young people everywhere whose career definition of "doing your own thing" encompasses self-employment or work in a small company or other organization.

A concentration in this field offers you a thorough "start-to-finish" perspective. The concentration provides courses that deal with each of these key questions:

1. What are the characteristics of people who start their own companies, and what does it take to start and build a new business?
2. What are some key sources of business opportunities, and how does one assess feasibility of a particular venture?
3. What sources exist for raising seed capital, and how does one acquire it?
4. What are the critical problems and opportunities in successfully managing a smaller company, and what managerial methods are appropriate to deal with these?
5. What are the key issues in financing and managing an ongoing, growing venture, and how can these be applied to small ventures?

A View of the Five-Year Concentration Courses in this concentration benefit students in several ways. They offer the opportunity to develop an ability to assess personal aptitude and potential for small business, to find and evaluate business opportunities, to secure adequate funding, and to organize and manage the various facets of the small business—marketing, finance, control, and personnel.

Entrepreneurship and New Venture Management presents students with the opportunity to prepare for a career in which they can be involved in the management of a business while maintaining a significant degree of autonomy and independence. Some students will enter this career at graduation or sometimes even before. However, many find that they obtain their first experience through cooperative work and postgraduate employment prior to establishing their own enterprises.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

II. Professional Requirements

Course	Q.H.	Course	Q.H.
New Venture Creation	4	Management of Smaller Enterprises	4
Opportunity Analysis & Venture Capital	4	Small Business Institute	
Small Business Finance	4	Field Project	8

Finance and Insurance Concentration

Professional Preparation

Aims The objective of the Finance and Insurance concentration is to train students for the financial management of businesses, nonprofit organizations, and governmental units. Preparation is twofold: students are offered *information* about current practices, theories, and concepts of financial management and have the opportunity to gain *experience* in analyzing situations that require financial decisions.

Description of the Concentration Almost every phase of economic activity involves aspects of financial management—of cash or other funds and of economic resources available to the individual, the business, or other economic unit.

Perhaps you can visualize your future career in one of the many areas of funds management: security analysis, estate planning, corporate finance and control, financial planning, security or insurance brokerage, underwriting, credit management, and banking. If so, you should consider the Finance and Insurance Concentration.

There are also career possibilities in specific financial institutions that perform indispensable services for present-day business and industry. Among these are banks, insurance companies, investment houses, credit concerns, financial service institutions, mortgage companies, and national and local real estate brokerage firms and appraisers.

Career openings can be sought in all areas of business, industry, and government, where financial planning and operation are vital.

A View of the Five-Year Concentration As a middler, you will take Introduction to Finance and beginning courses in other business fields. Following the introductory course, your required courses are Managerial Finance, Investment Management, and Money and Business Activity. Besides these required courses, many electives are available, including Securities Markets, Small Business Finance, Management of Financial Institutions, and Insurance. In addition, an independent study often may be an appropriate elective.

Specialization occurs in your upperclass years as you take advanced courses in insurance, investments, security markets, and basic business finance. To provide you with a well-rounded education, other courses are available, particularly in the broad area of economics.

All courses offered by the Department of Finance and Insurance are open to students in any concentration provided they have taken the prerequisite subjects. Instructors may waive prerequisite courses in special circumstances.

Subfields

Managerial Finance The two objectives of the finance function in the contemporary corporation or business entity include:

1. Providing needed funds on terms that are the most favorable in view of current planning;
2. Regulating the flow of funds to maximize the realization of objectives.

The key concerns of financial management are the capital structure of the business and the optimal manner in which its assets should be held. With only minor differences, these same broad objectives apply to the finance function of nonprofit organizations, including those in the public sector (units of government).

Management of Financial Institutions This area of specialization is broadly based within the subject area and is applicable to a variety of financial institutions and positions within them.

The three major topics of consideration in this area of specialization are:

1. The institutional structure of the financial system and the relation between it and the surplus and deficit units of the whole economy;
2. Asset, liability, and capital management problems of financial intermediaries;
3. Investment analysis and portfolio management policies appropriate to different financial intermediaries.

Investment and Management Analysis Two benefits result from studying this concentration. First, students can gain a general understanding, which may help them manage their own affairs. Second, those seeking professional careers in organizations where the investment function is paramount (industrial and utility corporations, real estate developments, financial institutions, and many governmental agencies are a few examples) will find this subfield of great assistance.

The concentration offers preparation in the specialized skills and principles that can benefit students who are interested in careers as investment managers or security analysts in the following organizations:

1. Stock exchanges, investment advisory firms, brokers-dealers, underwriters, mutual funds, and other investment companies that are a part of the securities markets;
2. Insurance companies, commercial banks, savings and loan associations, trust companies, mutual savings associations, and organizations involved in the activities of the securities markets; or
3. Federal and state governmental agencies such as the SEC, FDIC, Treasury Department, IRS, and others having regulatory responsibilities regarding the securities markets and their participants.

Insurance and Risk Management Risk management is the process of identifying, measuring, evaluating, and treating important risks. It is a relatively new, but growing, part of the management function in business as well as in government and other nonprofit organizations. Insurance is an important method of risk financing in all organizations, including the family unit. Some individuals may study one or a few courses in insurance and risk management to broaden their understanding of this area in order to better manage their personal affairs or to familiarize themselves with this area as part of their general management preparation. Others may wish to specialize in this area and seek careers in the risk management function in business as managers of corporate employee benefits programs; or as managers, adjusters, or underwriters in life insurance companies, property and liability insurance companies, insurance brokerage firms, insurance agencies, independent adjusting firms; or in a number of other careers in this vast field.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Managerial Finance	4	Investment Management	4
Money and Business Activity	4	Finance Electives	12

Human Resources Management Concentration

Professional Preparation

Aims Human resources management, which focuses on the effective utilization of people at work, is an extension of personnel and labor relations but includes more than the traditional areas of recruitment, selection, compensation, and training. A human resources manager also must be knowledgeable about manpower planning, equal employment opportunity laws and affirmative action procedures, organizational development, career planning, job design and motivation, leadership, and communications. The ultimate goal of human resources managers is to provide an organization with the people who will be most effective in their jobs.

Description of the Concentration In recent years there has been a growing interest in the quality of the employee's work life and its relation to the efficient production of goods and services. Companies such as Proctor and Gamble, AT&T, General Motors, and Burlington Mills, as well as a growing number of organizations in the public sector, are paying more and more attention to the quality of human performance at work and the level of human contributions to output. At a time when financial resources and investment capital are becoming scarcer, many organizations are beginning to take a closer look at the management of their people, their most precious resource. In recognition of this growing interest, Northeastern University's College of Business Administration offers an undergraduate concentration in Human Resources Management.

The effective management of human resources calls for a joint partnership among such organizational specialists as personnel administrators, labor relations negotiators, wage and salary analysts and operating line managers in the various functional areas (marketing, finance, production) of the company. As the traditional role of personnel administration is expanded to include affirmative action programs, job enrichment, and organizational development activities, career opportunities in the fields of labor relations and personnel administration are likely to expand in both the public and private sectors.

For the student whose career aspirations lie in fields other than personnel and labor relations, one important point should be made: human resources management is not a specialized activity confined to the personnel department. Whether you start your career as a work-flow analyst in manufacturing, a customer service assistant in marketing, a field auditor in the accounting department, or a hospital unit manager, you will be required to demonstrate skills in working with individuals and groups to achieve desired results.

A View of the Five-Year Concentration Human resources management is practiced not only by specialists in the area of personnel and labor relations, but also by line managers and specialists in many other business areas. The Human Resources Management concentration is structured to expose students to all major functions of personnel administration and labor relations.

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Introduction to Human Resources Management	4	Reward Systems	4
Selection and Assessment	4	Human Resources Management Electives	8
Contemporary Labor Issues	4		

International Business Concentration

Professional Preparation

Aims In recent years, several factors have contributed to a rapidly increasing need for qualified people in the field of international business. The growth of multinational firms, international trade, and regional international trading blocs has created a shortage of skilled managers who are equipped to analyze the complexities of international business problems.

The International Business Administration concentration offers students the opportunity to prepare themselves to meet these management needs. It offers the opportunity to develop an understanding of problems involved in operating business enterprises across national boundaries and to develop the ability to analyze the operations of businesses in multinational environments.

The curriculum consists of a broad education provided by course requirements in arts and sciences, a basic business education provided

by business administration core requirements, and a specialized education in International Business.

Description of the Concentration The International Business concentration consists of six courses. Two of them are required: Introduction to International Business and Seminar in International Business. There are also four electives: two from the International Business curriculum and two Business Electives. In addition, two of the nonbusiness electives must be chosen from the International List (see page 147).

When you enroll in the International Business concentration, you will find that its structure is flexible, permitting you to have a dual concentration. For example, you may concentrate in International Business and use open electives to fulfill the requirement of a second concentration. The dual concentration has advantages for those seeking employment opportunities in traditional functional areas (e.g., production, marketing, finance), which also take place in an international setting. All College of Business Administration courses that are offered as part of the International Business Administration concentration are available to students in other concentrations during their middler, junior, and senior years.

A View of the Five-Year Concentration Careers in international business are best pursued in companies that carry on trade or manufacturing operations in foreign countries. An increasing number of multinational firms require that candidates for their top management positions have prior experience in international operations. In addition, large banks and insurance companies want their managers to understand international business. Other types of organizations—government, trade associations, large unions—require international business knowledge. The opportunity for foreign travel in any of these capacities is frequently available.

Students who choose this concentration have the opportunity to gain an understanding of the economic, political, and social constraints on international business and to develop skills in analyzing the financial, marketing, and operational strategies of the multinational firm.

Arts and Sciences electives such as modern languages, political science, international economics, geography, and cultural anthropology—all appropriate to the understanding of international relations—are highly recommended to complement this concentration.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

 II. Professional Requirements

Course	Q.H.	Course	Q.H.
Introduction to International Business	4	Business Administration Electives (International List)	8
Seminar in International Business	4	Business Electives	8

International Electives**Business List***

- 41.160 International Accounting
- 43.261 International Marketing
- 44.160 International Financial Management
- 46.102 Comparative International Management
- 46.103 Environmental Pressures and the Multinational Corporation
- 48.110 International Transportation and Distribution Management

Non-Business List

(Note: This is a representative listing; other Liberal Arts courses may be taken upon approval by the Area Coordinator for the International Business concentration.)

- 20.130 Language and Culture
- 20.135 Individual and Culture
- 20.140 Evolution and Society
- 20.170 Culture in Transition
- 20.250 Political Anthropology
- 20.255 Economic Anthropology
- 20.270 Social Change and Economic Development
- 21.116 Environment and Society
- 22.112 Introduction to International Relations
- 22.113 Introduction to Comparative Politics
- 22.151 Comparative Government
- 22.179 World Politics
- 22.220 The Politics of Imperialism
- 22.221 International Relations
- 22.223 American Foreign Policy
- 22.231 International Organization
- 22.233 International Law
- 23.123 Europe Since 1921
- 23.128 Modern France
- 23.129 Modern Germany
- 23.137 England Since 1900
- 23.141 Soviet Russia
- 23.145 The Modern Middle East
- 23.151 Modern Africa
- 23.170 Modern Far East
- 23.171 The Far East Since 1945
- 23.172 Recent Leaders of Asia
- 23.182 Modern European Economic History
- 23.277 Modern Latin America
- 25.222 Third World Political Relations
- 26.279 Issues in Contemporary Islam
- 27.144 Latin American Art
- 27.182 Oriental Art II
- 32.201 Spanish for Business
- 33.201 German for Business I

- 33.202 German for Business II
- 39.150 Economics of World Energy and Primary Resources
- 39.155 Superpower Economics
- 39.259 European Economic Development
- 39.261 Economic History of Less-Developed Countries
- 39.280 Comparative Economics
- 39.285 Economic Development
- 39.286 International Economics

**These courses are not offered every year. Students are advised to consult preregistration material.*

Management Concentration

Professional Preparation

Aims Do your career interests lie in the broad area of administration rather than in specialized fields? The Management concentration offers you the opportunity to prepare yourself for a wide variety of administrative careers in business, government, and nonprofit institutions.

Description of the Concentration As a Management student you must have a basic understanding of all organization functions: accounting, marketing, finance, and operations. Your courses in these areas offer you an overview of these areas, including their interrelation and the ways they can be used as management tools. For example, your study of accounting can be used as a helpful tool in the decision-making process, rather than as a specialty in itself. A similar approach is used in courses in other areas.

Since management is the process of getting things done through people, your professors pay significant attention to "people problems" to stress the importance of developing an effective work force.

The courses in the Management concentration vary considerably in content and method of instruction because they vary in their objectives. In most, students are heavily involved in the conducting of classes and are required to work on group assignments. The purpose of this participatory approach is to help prepare you for the demands of management in the business community.

A View of the Five-Year Concentration The curriculum and teaching methods center around the development of basic skills and knowledge appropriate to administration, rather than upon specialized functional techniques. Although the case method of study is used extensively, a variety of teaching methods consistent with particular course objectives is employed. The basic objectives of the concentration are to confront the student with appropriate learning experiences, to help increase students' skills and knowledge in basic disciplines underlying administrative practice, and to help students develop judgment and skills in organizational problem analysis and decision making.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

 II. Professional Requirements

Course	Q.H.	Course	Q.H.
Cost Accounting for Management	4	Legal Aspects of Business	4
People and Productivity	4	Business Electives	12

Marketing Concentration

Professional Preparation

Aims A business organization not only designs and manufactures products, but also markets and sells them to manufacturers, wholesalers, retailers, and consumers. This is what a concentration in marketing is all about.

Description of the Concentration All the business activities that direct the flow of goods and services from producer to consumer are classified as marketing concerns. The marketing process begins by determining the needs and wants of customers. Once these wants and needs are established, the organization's first objective is to produce goods or services to satisfy a particular consumer. Essential in all types of business are such activities as product design, research, pricing, packaging, transportation, advertising, selling, and servicing. The overall responsibility for these functions rests with the marketing manager.

The Marketing Concentration offers a wide variety of courses, taught by lecture and class discussion. Included are such courses as Marketing Management, Advertising, Sales Management, Consumer Behavior, and Competitive Strategy.

A View of the Five-Year Concentration Outside the classroom, students may attend weekly meetings of the American Marketing Association Student Chapter, through which they may further their interests by discussing issues with leaders in the field.

Without successful marketing and advertising, industrial products remain unsold. More and more companies are finding that today's tempo of progress and high levels of production require up-to-date marketing techniques to generate a higher sales volume.

As members of the management policy group, marketing executives take a broad view of all aspects of business management and policy. They also serve effectively as trained specialists in their own areas.

Success in the market is vital to every company, whatever its size. Therefore, the need for adaptable and informed marketing management exists in all types of business and industry.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

 II. Professional Requirements

Course	Q.H.	Course	Q.H.
Marketing Management	4	Competitive Strategy	4
Marketing Research	4	Marketing Electives	12

Transportation and Physical Distribution Management Concentration

Professional Preparation

Aims Transportation is an integral part of national and international distribution systems. It is a determining factor in the availability and prices of goods and services in our economy.

In corporate distribution, transportation specialists operate within a complex organizational framework in which goods are stored and moved. Effective management of this distribution process involves understanding inventory control, warehousing, transportation options, and the interaction of these activities with other functional operations.

Growing concern with the economic and service conditions of the transportation industry has also created career positions with government agencies engaged in transportation policy development and administration. Other career possibilities are to be sought with carriers such as airlines, railroads, and trucking companies, which actively seek people who are familiar with the operational and regulatory aspects of their business.

The Transportation and Physical Distribution Management concentration offers students opportunities to prepare for these diverse career opportunities.

Description of the Concentration The concentration offers the student a balanced background in Transportation and Physical Distribution Management. Courses consider not only the viewpoint of the corporate shipper and carriers, but also those of public officials, in addition to consumer interests. Courses have a strong contemporary orientation and promote frequent interaction with practitioners from business and government.

A View of the Five-Year Concentration Course offerings in Transportation and Physical Distribution Management are sequential so that students who desire only an introductory exposure may take one or several courses as part of a broader business background. An undergraduate concentration in the area consists of six courses. Four are required courses, with the balance of the concentration composed of electives.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Principles of Transportation	4	Seminar in Transportation	4
Physical Distribution Management	4	Transportation Electives	8
Current Issues in Transportation Policy	4		

Non-Concentration (Self-Designed)

Professional Preparation

Aims Because innovation and relevance are key words in the College of Business Administration, the Non-Concentration curriculum is adaptable to each student's needs. Meeting with an academic adviser, you tailor your academic program to meet your own career goals.

Description of the Concentration Students will be required to select a total of at least six business electives beyond the basic course requirements.

The freshman-year program of studies and the basic course requirements for the College of Business Administration are the same for all the concentration areas. See page 139.

College of Computer Science

Paul M. Kalaghan, Ph.D., *Dean*

Helen B. Howard, A.S., *Assistant to the Dean*

Professors

Arthur C. Allison, Ph.D.
Richard A. Rasala, Ph.D.
Raoul N. Smith, Ph.D.
Patrick S. P. Wang, Ph.D.

Associate Professors

Kenneth P. Baclawski, Ph.D.
John Casey, B.A.
Agnes H. Chan, Ph.D.
Harriet J. Fell, Ph.D.
Stephen I. Gallant, Ph.D.
Graham H. Norton, Ph.D.
Viera K. Proulx, Ph.D.
Betty J. Salzberg, Ph.D.

Assistant Professors

Philip F. Carrigan, Ph.D.
Paul R. Holley, M.S.
Michael Weiss, Ph.D.

Instructor

Lawrence A. Bookman, M.S.

Professional Preparation

The College of Computer Science offers students the opportunity to concentrate in the broad field of computer science. The program is designed for men and women who are seeking to prepare themselves for productive careers in industry, government, or other organizations that design, develop, market, or utilize computing systems. A fundamental goal of the College is to help students develop the ability to recognize and solve problems arising in the use of modern digital computers in business and engineering as well as in educational and research environments.

In developing the skills necessary to achieve this goal, the student has the opportunity to assimilate ideas and concepts from theoretical studies; in-depth, hands-on programming of both large time-sharing systems and single-user microcomputers; and practical insight gained from the cooperative education experience.

The concentration in Computer Science is offered primarily on the five-year Cooperative Plan because of the inherent value of experience gained in an actual computer-oriented working environment.

Aims Recognizing that the advance of technological innovation casts the computer in ever-widening roles and brings the concept of the "information society" closer to reality, the College has adopted the following aims:

1. To understand the scientific principles that serve as the foundation of computer science;
2. To develop the habits of accurate thinking that are essential to the description and efficient analysis of computer-related problems;
3. To cultivate an awareness of the common features and mathematical bases of a wide variety of computational issues arising in apparently unrelated information-processing applications.
4. To communicate ideas and approaches in a clear and concise manner in a style appropriate to the audience;
5. To maintain an adequate awareness of the pace of information technology in order to lead innovation rather than follow it.

A View of the Five-Year Program Although students of computer science concern themselves, on the surface, with the languages used in writing computer programs, their involvement in the study of software design goes much deeper. Students have the opportunity to study the application of computers to many fields and to consider various approaches to storing maximal amounts of information in a system's storage devices and minimizing the time it takes to retrieve that information. How to select the best computer system for a particular application is of concern. Since errors can accumulate in computer calculations, computer science students are also expected to study ways in which such errors can be detected and minimized. A newly emerging topic is the methodology of program structure and design—a concern directed at determining the best approach to organizing large problems so that the chance for error, the difficulty of detecting an error, and the cost of correcting an error are minimized.

The Computer Science Program is designed in accordance with the recommendations of two large, national professional societies—the Association for Computing Machinery and the Mathematics Association of America. It offers a well-rounded and flexible program in which students are expected to fulfill certain minimum course requirements but are provided an unusually wide selection of electives from which to choose. In this way, students have the chance to plan a program of study according to the particular fields of computer applications most interesting to them.

Sample Program for Bachelor of Science in Computer Science

First Year

Quarter 1

10.150 Calculus I	4
*11.117 Physics I	4
06.100 Comp. Sci. I (Pascal)	4
30.113 English	4

Quarter 2

10.151 Calculus II	4
*11.118 Physics II	4
06.101 Comp. Sci. II (Pascal)	4
30.114 English	4

Quarter 3

10.152 Calculus III	4
*11.119 Physics III	4
Soc. Sci./Hum. Elec.	4
09.140 Appl. Prog. (COBOL)	4
06.110 Prog. Lang. Lab. I (LISP)	1

Second Year**Quarter 4**

10.153	Calculus IV	4
06.130	Assembly Lang. I	4
06.201	Data Structures	4
	Soc. Sci./Hum. Elec.	4
06.111	Prog. Lang. Lab. II (FORTRAN)	1

Quarter 5

10.210	Discrete Math	4
06.131	Assembly Lang. II	4
03.191	Comp. Org. & Des. I	4
	Soc. Sci./Hum. Elec.	4
06.112	Prog. Lang. Lab. III	1

Third Year**Quarter 6**

10.246	Linear Algebra	4
06.220	File Processing	4
03.192	Cmp. Organ. & Des. II	4
	Coordinated Study	4

Quarter 7

**05.145	Probability	4
06.230	Operating Systems	4
	Coordinated Study	4
	Soc. Sci./Hum. Elec.	4

Fourth Year**Quarter 8**

**05.147	Statistics I	4
06.240	Analysis of Prog. Lang.	4
06.250	Automata & Formal Lang.	4
	Soc. Sci./Hum. Elec.	4

Quarter 9

06.260	Compiler Design I	4
06.265	Analysis of Algorithms	4
	Coordinated Study	4
	Soc. Sci./Hum. Elec.	4

Fifth Year**Quarter 10**

	†Comp. Sci. Elective	
	Coordinated Study	4
	Coordinated Study	4
06.291	Comp. Sci. Project	4

Quarter 11

	Coordinated Study	4
	Coordinated Study	4
	Soc. Sci./Hum. Elec.	4
06.295	Comp. Sci. Seminar	4

*Students with a very strong interest in life science may be allowed to substitute 12.127–12.129 or 18.131–18.133 if schedule permits fulfillment of the prerequisites for course 03.191.

**Students interested in the theoretical aspects of computer science should substitute 10.208 and 10.220.

†06.280 Artificial Intelligence, 06.210 Computer Graphics, or 06.225 Data Base Management.

On balance, the program offers a strong foundation in mathematics and a variety of program design and analysis courses. The requirement for seven quarters of social science/humanities electives provides opportunity for students to broaden their horizons and to obtain a cultural context in which to imbibe the technical concepts of computer science.

Specimen Program in Computer Science: Effective Date: Fall 1983**First Year****Quarter 1**

06.100	Comp. Sci. I	4
10.150	Calculus I	4
30.113	Fresh. Writing	4
23.101	Western Civ.	4

Quarter 2

06.101	Comp. Sci. II	4
10.151	Calculus II	4
10.211	Discr. Math I	4
23.102	Western Civ.	4
06.110	FORTRAN Lab	1

Quarter 3

06.102	LISP	4
10.152	Calculus III	4
11.101	Physics I	4
30.114	Intro. Lit	4
06.113	COBOL LAB	1

Second Year**Quarter 4**

11.102	Physics II	4
06.130	Assembly Lang. I	4
06.201	Data Structures	4
10.153	Calculus IV	4
06.111	DCL Lab	1

Quarter 5

11.103	Physics III	4
06.131	Assembly Lang. II	4
10.212	Discrete Math II	4
06.205	Software Design	4

Third Year**Quarter 6**

03.191	Comp. Org. & Des. I	4
10.246	Linear Algebra	4
06.000	Comp. Sci. Elective (1)	4
	Elective/Subarea (2)	4

Quarter 7

03.192	Comp. Org. & Des. II	4
10.208	Probability	4
06.000	Comp. Sci. Elective (2)	4
30.200	Tech. Writing	4

Fourth Year**Quarter 8**

06.000	Comp. Sci. Elective (3)	4
06.000	Comp. Sci. Elective (4)	4
	Elective/Subarea (3)	4
	Elective/Subarea (4)	4

Quarter 9

06.000	Comp. Sci. Elective (5)	4
06.000	Comp. Sci. Elective (6)	4
	Elective/Subarea (5)	4
21.173	Computers & Soc.	4

Fifth Year**Quarter 10**

06.000	Comp. Sci. Elective (7)	4
	Elective Subarea (6)	4
	Elective/Subarea (7)	4
	Elective/Subarea (8)	4

Quarter 11

06.000	Comp. Sci. Elective (8)	4
06.296	Comp. Sci. Seminar	1
	Elective/Subarea (9)	4
	Elective/Subarea (10)	4
	Elective/Subarea (11)	4

Note: Three of the Computer Science Electives must form a complete track.

Awarding of Degree

The Bachelor of Science in Computer Science degree is conferred by the College of Computer Science.

College of Criminal Justice

Norman Rosenblatt, Ph.D., *Dean*

Robert D. Croatti, *Associate Dean*

Lester W. McCullough, Jr., *Assistant Dean*

Robert E. Fuller, *Assistant to the Dean*

Kathleen M. Higgins, *Coordinator of Educational Services in Forensic Science*

Laurie A. Mulcahy, *Administrative Assistant for Graduate Programs*

Professors

Romine R. Deming, Ph.D.

Theodore N. Ferdinand, Ph.D.

Edith E. Flynn, Ph.D.

Robert R. J. Gallati, S.J.D.

Joseph J. Senna, M.A., D.Jur.

Robert Sheehan, M.A., D.Jur.

(Honorary)

Associate Professors

James A. Fox, Ph.D.

Nicole F. Rafter, Ph.D.

Assistant Professors

John H. Laub, Ph.D.

Frank A. Schubert, D.Jur.

Wallace W. Sherwood, L.L.M.

Professional Preparation

Aims Established in 1966 under a grant from the Ford Foundation, the College of Criminal Justice offers its students the opportunity to prepare for professional careers in the fields of criminal justice and private security; through its prelegal studies concentration, many students also eventually enter law school. The curriculum has been designed to offer students a broad academic foundation upon which to base a professional concentration of courses that introduce students to specific career areas. Legal studies, law enforcement, private security, corrections, probation and parole, and forensic science are some of the areas of interest pursued by students. It is also expected that a number of graduates will choose advanced study in academic fields such as criminology, forensic science, social work, public administration, and law, as well as in the entire area of criminal justice.

The College was founded to help prepare students to enter professions that deal with some of the most important social issues of our times. To deal with these issues and to help prepare graduates for careers that are rewarding and beneficial, innovative methods and ideas, as well as the most advanced thinking, are utilized by the College of Criminal Justice. As a reflection of its significant role in higher education, the College has received substantial grants from the Department of Justice and was designated both as a training center in criminal justice and as a center of education and innovation in the field of criminal justice and forensic science.

A View of the Five-Year Program The College of Criminal Justice offers a five-year academic program on the Cooperative Plan of Education, which allows a candidate for the baccalaureate degree to undertake a specialized program of study. It is anticipated that co-op assignments may include work in Parole or Probation Offices, law firms, police departments, private security agencies, public or private institutions, social agencies, prisons, planning and evaluation units, or other areas related to the criminal justice program.

Students are offered a broad educational background for future roles in criminal justice, private security, or law. Because students are preparing for careers involving the social problems of people from all walks of life, course work in the social sciences, behavioral sciences, and the

humanities is integrated with professional courses. The liberal content of the curriculum is highly desirable not only for its value as a foundation upon which general intellectual development may be based, but also as an indispensable educational requirement for professional development.

Graduates must be prepared to judge objectively the many socioeconomic problems inherent in the administration of justice in contemporary American society. The College of Criminal Justice helps to prepare students for a career that will be not only personally productive and rewarding, but intellectually stimulating as well.

Graduation Requirements

Candidates for the Bachelor of Science degree must complete all the prescribed work of the curriculum, a total of 172 quarter hours of credit.

Students who undertake the Cooperative Education Program must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

No student transferring from another college or university is eligible to receive a degree until at least one year of academic work immediately preceding graduation has been completed at Northeastern.

Graduation with Honors

Candidates who have achieved superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University for at least six academic quarters before they become eligible for honors at graduation.

Sample Freshman-Year Program of Studies in the College of Criminal Justice

First Quarter

English
Economics
Introduction to Sociology
Introduction to Law and the
Legal Process

Third Quarter

Economics
Foundations of Psychology
Introduction to American
Government
Administration of Criminal
Justice

Second Quarter

English
Foundations of Psychology
Introduction to Politics
Critical Issues in Criminal
Justice and Criminology

In addition to the above courses, students may elect to take Basic ROTC.



Basic Course Requirements**I. General Requirements**

Course	Q.H.	Course	Q.H.
Principles and Problems of Economics*	8	Introduction to Sociology*	4
Introduction to Politics*	4	Freshman Writing*	4
Introduction to American Government*	4	Introduction to Literature*	4
Foundations of Psychology I & II*	8	State and Local Government†	4
		Western Civilization	8
		Science or Math†	8
		Non-CJ Electives (13)	52

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Administration of Criminal Justice*	4	Constitutional Problems†	4
Critical Issues in Criminal Justice and Criminology*	4	Criminal Justice Research	4
Introduction to Law and the Legal Process	4	Criminal Justice Electives (9)	36
Criminology†	4		
Criminal Law†	4		

*Courses are usually taken in the freshman year.

†Courses are usually taken in the sophomore year.



College of Engineering

Harold Lurie, Ph.D., *Dean*

Richard J. Murphy, Ph.D., *Associate Dean*

Ralph S. Blanchard, M.S., *Associate Dean*

John G. Proakis, Ph.D., *Associate Dean and Director of the Graduate School*

David C. Blackman, M.S., *Assistant Dean and Director of Minority Affairs*

Bradford C. Perry, M.Ed., *Director of Student Services*

Paula G. Leventman, Ph.D., *Assistant to the Dean*

Professional Preparation

The College of Engineering prepares students to participate constructively in a technologically changing world, thus contributing as professional engineers to the accumulation and application of new knowledge. Fundamentals are emphasized, thus offering students the opportunity to obtain the basic technical knowledge necessary to practice in a variety of positions. At the same time, study of the social sciences and humanities provides an awareness of the social, economic, political, aesthetic, and philosophical influences that are part of the context in which students will practice their professions.

Aims The concept of education as a continuing, lifelong process necessary for effective work in an environment of constantly new facts, ideas, and scientific principles underlies the whole structure of the engineering curriculum.

Engineering education is directed toward assisting students to:

1. Understand the scientific principles and knowledge of a particular branch of engineering selected;
2. Comprehend and develop competence in the engineering method and its application;
3. Communicate effectively and succinctly the important results of any technical study both verbally and graphically;
4. Acquire the motivation for continuing professional growth.

Day Cooperative Programs

The College offers five-year cooperative programs in Civil, Mechanical, Electrical, Chemical, and Industrial Engineering leading to the degree of Bachelor of Science with specification according to the engineering department in which the student qualifies. The College also offers a General Engineering Program, which leads to the awarding of an unspecified Bachelor of Science degree, through which students have the opportunity to design a curriculum suited to their objectives. The various curricula offer students the opportunity to prepare effectively for employment in industry or postgraduate study.

Under the six programs, several options or specialized concentrations are available:

Electrical Engineering—Power Systems Option To meet the needs of the rapidly expanding electric power industry, Northeastern has a special program in Power Systems Engineering. This program is offered on the Cooperative Plan and can lead to both a bachelor's and a master's degree in six years. The subject matter is basically that of electrical engineering augmented by work in power systems analysis, computers in power systems, nuclear plant considerations, power system planning, protection and stability, and MHD and DC transmission.

Civil Engineering—Environmental Option This option is designed for engineering students intending to work in the field of environmental protection and improvement. Topics included at the undergraduate level are water supply, treatment and wastewater disposal, solid waste disposal, and air pollution. The cooperative program, leading to a bachelor's degree in civil engineering in five years, offers students the opportunity to enter immediately a professional practice in government agencies, industry, or private consulting firms, depending on the job market as well as their own industry and abilities.

Computer Studies The computer, virtually nonexistent thirty years ago, has spawned several of the fastest-growing professions in the world. The demands for people educated in the design and use of computers have reached unprecedented levels in recent years.

Under Electrical Engineering, the Computer Engineering option is concerned with the design of digital computers and their integration within larger systems for communications, resource management, and automatic control. The computer engineering team for a large computer-system development project includes computer architects, software engineers, microprogrammers, logic designers, and electronics engineers. On the other hand, the computer engineer may have sole responsibility for all of these activities during the development of a microprocessor-based instrument or controller. Further details on this program are discussed on page 170, in the section devoted to the Department of Electrical and Computer Engineering.

Graduate programs of study in Computer Science and in Information Systems are offered by the Departments of Electrical and Computer Engineering and Industrial Engineering and Information Systems. These programs are described fully in the Graduate School of Engineering catalog, which can be obtained by writing to the School's director.

Five-Year BS/MS Programs

Several majors (Electrical, Mechanical, and Industrial Engineering) offer programs leading to both the Bachelor's and Master's degrees in five years. Students with outstanding academic records (3.0 or better) may begin carrying extra courses in the third year. In the senior year, these students forgo one cooperative work quarter and attend school full time to complete the course requirements for both degrees.

Part-time Program Offered During Evening Hours

The College of Engineering also offers a six-year, part-time curriculum leading to the degree of Bachelor of Science in Electrical, Mechanical, or Civil Engineering. Classes are held in the evening. Admission and course requirements are the same as for the degree program offered under the Cooperative Plan. For further information, consult the evening bulletin of the College of Engineering, or call the Dean of Engineering's office.

General Description of Programs

The undergraduate academic program begins with three quarters of full-time study. Course work during the first year helps to build students' understanding of mathematics and the physical sciences and to improve their ability to communicate ideas both verbally and graphically. The freshman courses act as a foundation for upperclass studies and

assist students in developing basic understanding of concepts in the engineering sciences and introduce them to the engineering method and its application. About four-fifths of the upperclass program is devoted to scientific and technological study, and about one-fifth to humanistic-social courses, with the aim of balancing the students' growing technical proficiency with an appreciation of the nontechnical aspects of society and culture.

Cooperative work in the chosen branch of engineering begins upon completion of the freshman year and continues throughout the remaining upperclass years. The work assignments during this time may be most valuable in helping to integrate the important elements of both an engineering and a liberal arts education. They can also be instrumental in teaching the value of teamwork while, at the same time, helping the student to acquire insight into the problems of actual engineering practice.

Graduation Requirements

Degrees The College awards the Bachelor of Science degree in Chemical, Civil, Electrical, Industrial, and Mechanical Engineering, as well as the Bachelor of Science degree without specification.

Qualification for Degrees Candidates for the Bachelor of Science degree must complete all of the prescribed work of the curriculum in which they seek to qualify with no academic deficiencies. Students who undertake cooperative work assignments must complete a minimum of four quarters of cooperative work experience approved by the Department of Cooperative Education.

Students transferring from another college or university are not eligible to receive the Bachelor of Science degree until they have completed at least one academic year at Northeastern immediately preceding their graduation.

Graduation with Honors

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University at least six quarters before they may become eligible for honors at graduation.

Accreditation

All undergraduate day programs with specification, offered solely by the College of Engineering, as well as the part-time evening programs in Civil and Electrical Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) (formerly the Engineer's Council for Professional Development).

Women in Engineering

Recognizing its opportunities, more women are entering the field of engineering every year. Aware of their qualifications and potential, industry and government provide positions of responsibility for competent women engineers. Any woman with scientific or technical interests should consider the many possibilities offered in engineering.

Women currently account for almost 10 percent of engineering freshmen. Women in engineering are represented with a chapter of the Society of Women Engineers, which offers a full schedule of technical and professional programs.

Minorities in Engineering

Through its Progress in Minorities in Engineering (PRIME) program the College seeks to expand educational opportunities for qualified blacks, Puerto Ricans, Mexican-Americans, and Native Americans. It can provide scholarships based on merit and/or need. Every effort is made to provide enough aid so that outside work is not necessary during the freshman year. Guidance counseling and tutorial services are among the support services provided by the program.

For more details, contact David C. Blackman, Assistant Dean, Minority Affairs; 400 Churchill Hall, Northeastern University, Boston, Massachusetts 02115.

Sample Freshman-Year Program of Studies in Engineering

The freshman-year program of studies in the College of Engineering is the same for all designated majors in the College.

First Quarter

FORTRAN Programming
Calculus
Physics
English

Third Quarter

Calculus
Physics
General Chemistry
English

Second Quarter

Graphics and Design
Calculus
Physics
General Chemistry

The first-year pattern of two-term courses may vary according to assigned section.

In addition to the above courses, students may elect to take Basic ROTC.



Chemical Engineering

Elisabeth M. Drake, Sc.D., *Cabot Corporation Professor and Chairperson*

Professor

John A. Williams, Ph.D.

Associate Professors

Ralph A. Buonopane, Ph.D.

Bernard M. Goodwin, Sc.D.

Richard R. Stewart, Ph.D.

Assistant Professors

Francis C. Brown, Ph.D.

Ronald J. Willey, Ph.D.

Instructors

Huei Luo, M.S.

Mounir Mazzawi, M.S.

Professional Preparation

Aims Since the field of chemical engineering is so varied, the program of study has been designed to offer students broad training in which fundamental principles are stressed, thus providing them with the strong background needed to acclimate themselves readily to graduate school or to an industry of their choice. The faculty also stresses the principles of environmental control, conservation, and societal responsibility to emphasize the importance of the engineer's role in society.

Description of the Major The chemical engineer has been defined as a "professional experienced in the design, construction, and operation of plants in which materials undergo chemical and physical change." It is the task of the chemical engineer to reduce the costs, increase the production, improve the quality of existing products and innovate new products.

Chemical engineering has grown out of discoveries in the chemical laboratories which have served as a foundation for a great many new industries whose production processes involve chemical as well as physical changes.

Petroleum refining, plastics, manufacture of synthetic fibers, and hundreds of other industries require men and women trained in chemistry as well as in engineering. Moreover, much of the training received by the chemical engineer is now being applied to the rapidly developing fields of nuclear engineering, energy, space engineering, and environmental controls. In order to benefit mankind by *not* contributing to pollution or waste of resources, many older industries, such as foods, textiles, paints and varnishes, and leather, are also employing chemical engineers. Computer process controls are being designed to fine tune older plants and computer-aided design of new plants is becoming increasingly common.

A View of the Five-Year Major After students have taken the fundamental courses in chemistry, mathematics, and physics, required of all engineering students, they may go on to advanced courses which apply these fundamentals to the solution of engineering problems. These upperclass courses are a skillful blend of the latest mathematical and theoretical analyses and the practical aspects of the profession.

Chemical engineering is one of the fastest-growing major fields of engineering. Tremendous growth is occurring in research and development, especially in such fields as petroleum and chemicals (about one-third of all chemical engineers are employed in these fields).

Accreditation

The Department is accredited by the American Institute of Chemical Engineers as well as by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology (ABET).

Laboratories

The chemical engineering laboratories are designed to acquaint the student with the experimental approach to the solution of engineering problems and to develop research interests. Graduate research may be conducted in such areas as energy, pollution control, photoreactions, polymers, process control, mathematical modeling, and computer applications.

Students are first exposed to the basic measurements in engineering in experimental methods laboratories, with emphasis on temperatures, pressure, and flow rate. Following this, they are given problems involving such areas as transport properties, kinetics, thermodynamics, and process dynamics, which they must solve experimentally. They are required to design and conduct the experiment, reduce the data using computers, and write a final report. Students use pilot-scale chemical engineering equipment in the experiment, when applicable.

The freshman-year program of studies in the College of Engineering is the same for all majors in the College. See page 161.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
English*	8	Physics†	4
General Chemistry*	8	Physics Lab†	2
Physics*	12	Calculus†	8
Calculus*	12	Mathematical Analysis	8
Engineering Graphics*	4	Economics	8
Computers for Engineering*	4	Social Science/Humanities Electives (4)	16

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Organic Chemistry†	8	Experimental Methods	8
Physical Chemistry	8	Chemical Engineering Thermodynamics	4
Chemical Engineering Calculations†	8	Chemical Engineering Kinetics	4
Polymer Science and Engineering†	4	Process Design or Research Project	12
Transport Phenomena	8	Chemical Engineering Electives (4)	16
Chemical Engineering	8		

*These courses are usually taken in the freshman year.

†These courses are usually taken in the sophomore year.

Civil Engineering

Jerome J. Connor, Jr., Sc.D., *William Lincoln Smith Professor and Chairman*

Professors

Reginald L. Amory, Ph.D.
 Frederic C. Blanc, Ph.D.
 John J. Cochrane, Ph.D.
 Constantine J. Gregory, Ph.D.
 Kenneth M. Leet, Sc.D.

Associate Professors

Leroy M. Cahoon, M.S.
 Walter E. Jaworski, Sc.D.
 Michael Kupferman, Ph.D.
 Robert L. Meserve, M.S.
 Saul Namyet, B.S.
 Hormoz Pazwash, Ph.D.
 James C. O'Shaughnessy, Ph.D.
 John G. Schoon, Ph.D.
 Richard J. Scranton, M.S.
 Barbara M. Taylor, Ph.D.
 Irvine W. Wei, Ph.D.
 Mishac K. Yegian, Ph.D.

Assistant Professors

Menashi D. Cohen, Ph.D.
 Peter G. Furth, Ph.D.
 Duc T. Nguyen, Ph.D.
 Spiro N. Pollalis, Ph.D.
 Stanley W. Zagajeski, Ph.D.

Instructors

George H. Brattin, M.S.
 Jack C. Y. Chen, M.S.
 Irwin Silverstein, M.S.

Professional Preparation

Aims Students in the Civil Engineering Department have the opportunity to prepare themselves for a professional career in one or several of the areas into which the field is traditionally divided: structures, environmental (water supply, wastewater disposal, air pollution), transportation, soil mechanics and foundations, and construction. A major aim of the program is to provide students with the opportunity to acquire a fundamental, flexible, and rigorous engineering education so that, in view of inevitable change within the field, graduates will be in a position to build continuously on their basic knowledge. A wide range of electives in the humanities, social sciences, and basic sciences encourages students to investigate areas outside their specific technical focus and to extend their personal interests and involvements.

A View of the Five-Year Major The five-year study curriculum is divided into eleven quarters of school and eight quarters of cooperative work assignments. The work phase is designed to allow the student to gain insight into all types of activity normally confronted by the civil engineer. Thus, the well-motivated student can determine from these work experiences what further course work preparation will be required to become successful as a practicing civil engineer. The work experience also may be valuable in stimulating a certain amount of self-support and independence.

The first years of the curriculum are, for the most part, devoted to the fundamentals of math, basic sciences, and engineering that comprise the foundation for later professional studies. The final years are devoted to a range of professional subjects, both required and elective. Guidance from a faculty adviser is available throughout the academic program.

The curriculum is thus intended to offer a firm educational background for students preparing for a career in the planning, design, and construction of structures, transportation systems, and environmental systems as civil engineers.

Upon completion of the requirements for the Bachelor of Science in Civil Engineering degree, the graduate may choose to enter the engineering profession or to go on to graduate school for advanced training. The beginning civil engineer will probably find that graduate course work is a prerequisite for advancement.

During the first period of employment as a graduate, the civil engineer may expect to spend some time in the field or the office in work involving design computations, layout work and supervision of construction, or obtaining and analyzing information for studies and reports. With increased experience, the graduate will be better prepared to take on greater challenges and more responsibilities.

Graduates normally seek employment at municipal, state, and federal agencies and in private consulting practice, general construction, and industry.

Part-Time Program

The Civil Engineering Program is also available on a part-time basis. The classes are scheduled during the evening hours, usually two evenings per week. The curriculum can be completed in a minimum of six years.

Transfer programs for qualified students with Associate's degrees or Bachelor's degrees in Civil Engineering Technology can be arranged in either the day co-op or the part-time programs.

Student Professional Society

Our Student Chapter of the American Society of Civil Engineers is very active. In addition to traditional activities, which include sponsoring weekly professional speakers and occasional field trips to civil engineering construction sites and constructed facilities, members have successfully completed several significant community-service projects valued at approximately a quarter of a million dollars.

The students have developed and designed innovative and educational outdoor play exhibits illustrating both natural and man-made phenomena for the Children's Museum of Boston. They have participated, in conjunction with the Southwest Corridor Community Farming Project, in the design and construction of a solar-heated greenhouse. They have worked with staff members of the Joseph P. Kennedy, Jr., Memorial Hospital for Children in the planning, design, financing, and construction of a special playground for handicapped children. They have designed and constructed an outdoor amphitheater for the Salvation Army's Camp Wonderland, and performed an investigation of fire evacuation procedures and building modifications for the Cotting School for the Handicapped. The students have designed and constructed a play-therapy center for Boston Children's Services Association and a unique play area for the Language and Cognitive Development Center. Each year, at least one such community-service project is undertaken.

In recognition of these unusual efforts, our Student Chapter has been designated as the "single most outstanding" chapter in the nation and consequently has received the Robert Ridgway Award of the American Society of Civil Engineers for an unprecedented six consecutive years.

Computer Facilities

The Civil Engineering Department uses a variety of computer facilities to complement course work and research. Direct access to the University's VAX 11-787 computer is available through numerous soft- and hardcopy remote terminals, while access to the College's Data General mainframe is available through hardwired hookups within the department. The department has two minicomputers (a Hewlett-Packard System 45 with interactive graphics and a Digital LSI-11) for laboratory data acquisition. In addition, Civil Engineering also has a microcomputer facility consisting of IBM personal computers, Apple II's, MAC 8's, and digital plotter, printer, and telephone hookups to the University mainframe. All systems are supported with sophisticated packages with applications to all disciplines of civil engineering.

Laboratories



Soil Mechanics Laboratory The soils laboratory is equipped to perform the full spectrum of soil tests, as well as to conduct model studies.

A wide variety of laboratory equipment permits students to perform tests ranging from those related to soil classification to sophisticated triaxial tests that are required to evaluate the stress-strain properties of a soil specimen. The triaxial tests can be of strain-controlled loading, stress-controlled loading, or a combination thereof. Pore-pressures measurements are made either electronically with pressure transducers or manually with null-pressure indicators.

Consolidation-test equipment of various load ranges and types is available. Consolidation tests applying loads up to 50 tsf on the sample are possible. The laboratory is equipped with a wide range of electronic devices, including pressure transducers, load cells, and accelerometers to expedite data collection.

Research with the aid of models can be conducted to study the problems associated with the design and construction of earth dams, open-braced cuts, and other similar structures. In addition, model studies on the behavior of footings or piles are possible for both static and cyclical loading conditions.

Materials Laboratory The materials laboratory provides for both research and teaching needs. Capabilities are in the experimental determination of the physico-chemical properties of materials. These include destructive and nondestructive strength determinations, microstructural and chemical analyses.

Water-Quality Laboratory Capabilities include analyses of both water and wastewater samples in physical, chemical, and biological regimes. Laboratory and supporting equipment enable complete studies in the following areas: water analysis, wastewater analysis, trace-metal and organic analysis, stream and estuary studies, waste-treatability studies, unit operations, bioassay techniques, pilot plant studies, tracer studies, and complete instrument analysis.

Instrument analysis capabilities include atomic absorption, total carbon, organic carbon, specific ions, gas chromatography, spectrophotometric, and gravimetric analyses.

Special areas are available for unit operation studies in water and wastewater treatment. A well-equipped machine shop has been established so that special equipment can be designed and built for model-prototype studies.

The Gillette Environmental Research Laboratory is available for research and development work in connection with the program in Environmental Engineering and Science.

Air Pollution Laboratory Equipment is available to sample ambient air and gaseous and particulate pollutants and to evaluate the physical, chemical, and biological characteristics of atmospheric pollutants. Continuous air samples may be established in any area in Metropolitan Boston and the samples analyzed by ultraviolet-visible, fluorescence and atomic spectrophotometry, as well as gas chromatography and infrared techniques. A portable carbon-monoxide analyzer with printout equipment is available for measurement studies and research work. Research in air pollution problems is a continuing project.

Recent equipment additions also make it possible to conduct studies in noise pollution.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
English*	8	Physics†	4
Calculus*	12	Physics Lab†	2
Basic Engineering*	8	Economics	8
Physics*	12	Math	8
Chemistry*	8	Public Speaking	2
Calculus†	8	Social Science/Humanities	
		Electives (5)	20

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Thermodynamics†	4	Professional Electives—7 required	
Engineering Measurements†	6	Civil Engineering Systems	4
Structural Mechanics†	8	Structural Analysis II, III	8
Dynamics	4	Structural Design II	4
Materials (W. Lab)	6	Concrete Design II	4
Fluid Mechanics	4	Hydraulic Engineering	4
Electrical Engineering	4	Geotechnology	4
Soil Mechanics (w. Lab.)	6	Foundation Engineering	4
Environmental Engineering I	4	Transportation Analysis and Planning	4
Concrete Design I	4	Applied Probability Theory for Civil Engineering	4
Structural Design I	4	Environmental Engineering II, III	8
Structural Analysis I	4	Environmental Design	4
Computer Applications in Civil Engineering	4	Air Pollution	4
		Statistics	4
		Engineering Economy	4
		Construction Engineering	4
		Highway Engineering	4
		Structural Mechanics III	4
		Technology Assessment	4
		Legal Aspects of Civil Engineering	4

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

The freshman-year program for the College of Engineering is the same for all majors in the College. See page 161.

Electrical and Computer Engineering

Harold R. Raemer, Ph.D., *Professor and Acting Chairman*

Professors

Basil L. Cochrun, M.S.
Ladislav Dolansky, Ph.D.
James M. Feldman, Ph.D.
Kenneth I. Golden, Ph.D.,
George A. Snell Professor
Robert A. Gonsalves, Ph.D.
Arvin Grabel, Sc.D.
Martin E. Kaliski, Ph.D.
John G. Proakis, Ph.D.
Wilfred J. Remillard, Ph.D.
J. Spencer Rochefort, M.S.
Sheldon S. Sandler, Ph.D.
Mulukutla S. Sarma, Ph.D.
Martin E. Schetzen, Sc.D.
Walter C. Schwab, Ph.D.
Michael B. Silevitch, Ph.D.
Robert D. Stuart, Ph.D.

Associate Professors

Marcello J. Carrabes, M.S.
J. Duncan Glover, Ph.D.
Richard E. Grojean, M.S.

Wayne G. Kellner, Sc.D.
William F. King, M.S.
Walter H. Lob, M.S.
Robert N. Martin, M.S.
Louis* Nardone, M.S.
Sheila Prasad, Ph.D.
Michael Rudko, Ph.D.

Assistant Professors

Elizabeth E. Ames, Ph.D.
Amir Farhat, Ph.D.
Vinaykumar Ingle, Ph.D.
Robert Jackson, Ph.D.
John W. Ketchum, Ph.D.
Kaveh Pahlavan, Ph.D.
David Papurt, Ph.D.
William Rutz, Ph.D.
Josef Skrzypek, Ph.D.
David G. Wimpey, Ph.D.

Instructors

Ali Moezzi, M.S.
Prawat Nagvajara, M.S.
Ta Siu, M.S.

Professional Preparation

Aims Among their many achievements, electrical engineers have been primarily responsible for the development of the computer, integrated circuits, the pacemaker, satellite communication, space navigation, microprocessors, television, and the means of providing the energy needed to run our cities and our industries. At present, electrical engineers are working to help find solutions to the problems of information transfer and management, industrial productivity, energy conservation and alternative energy sources, transportation, and health care.

This is just a small sample of the growing wealth of evidence that indicates that electrical engineering has impact on all facets of our culture. As with all branches of technology, the societal functions and aims of electrical engineering are to maintain and improve the quality of life.

Description of the Major Despite the diversity of its application, electrical engineering may be conveniently divided into two broad, general areas of information sciences and energy resources. The area of information sciences is concerned primarily with systems whose function is computation, communication, or control. Included in this area are the circuits and devices that comprise the systems and the application of the systems and engineering techniques to other disciplines. Energy resources deal with problems related to the sources, generation, and distribution of large quantities of electrical energy. It should be noted, however, that no rigid boundary exists between the two areas, and many of the technical specialties within electrical engineering are applicable to both areas.



Many electrical engineers are involved with the more traditional activities of system design and development, such as the information sciences or energy resources areas. Other electrical engineers apply the knowledge gained in their professional education to such disciplines as ocean exploration, meteorology, experimental psychology, electronic music, health-care systems, bioelectronics, and educational devices for the disadvantaged.

The optimistic outlook for electrical engineering is based on the breadth of the technical activity described above. We are constantly reminded that among the pressing problems in our society are improvement of industrial productivity, the energy crisis, data communication and management, urban transportation, health care, and the plight of the socially and physically disadvantaged.

No one has yet been able to forecast how these problems will be solved without the use of technological resources. Readily available electrical energy, data processing, electronic instrumentation and control, and communication are among the crucial resources needed.

A View of the Five-Year Major The purpose of the curriculum is to offer the student an education that has the breadth and depth necessary for professional practice. Breadth is needed to give the student an awareness of all that electrical engineering encompasses and to provide the necessary background for independent study, a major criterion for professional success. Individual career objectives and initial professional achievement can result, in part, from learning a subject area in some depth. To achieve the balance between depth and breadth, the curriculum is divided into the *core program* and *elective courses*.

The core program includes those courses with content applicable to all specialties in electrical engineering and offers students a basic background for future learning. Subject areas covered in the core program include:

1. Circuits and systems
2. Electronic devices and circuits
3. Digital computer design
4. Electromagnetic theory
5. Electromechanical dynamics (energy conversion)
6. Electrical measurements (laboratories)

The elective courses are designed to permit students to develop their own interests. Many students use this part of the program to learn a particular subject in depth and to better prepare for graduate studies. A broad range of courses is offered, including Digital Computer Techniques, Numerical Methods, Communication Systems, Control Systems, Advanced Electronics, Solid-state Devices, Power Systems, Wave Propagation and Distributed Circuits, Network Theory, and Mathematical Techniques in Electrical Engineering.

In addition, students who wish to conduct individual projects or learn about a subject area not offered in an elective course may enroll in the senior project course and work with an interested faculty adviser on a one-to-one basis.

Electrical engineering graduates of Northeastern have attended and done well at all of the prestigious graduate schools. Those who have entered industry find they compare favorably with graduates of other institutions and many have risen to positions of leadership in their professions.

Five-Year B.S.-M.S. Program

Students with high QPAs may elect the five-year B.S.-M.S. program. By taking some course overloads and forgoing one senior co-op term, a student may complete requirements for both the B.S.E.E. and M.S.E.E. degrees in five years.

Option in Power Systems Engineering

The Power Systems Engineering Program in Electrical Engineering is a special option for those who wish to specialize in energy resources. This program is conducted in cooperation with the electric power companies in New England and other eastern states. The Master's degree can be obtained in six years of cooperative education or through the five-year B.S.-M.S. program described above. For further information about this program, students are advised to contact Dean Philip R. McCabe, Admissions, 150 Richards Hall.

Option in Computer Engineering

Martin E. Kaliski, Ph.D., *Director*

The option in Computer Engineering is provided for those who wish to specialize in the design of digital computers and their integration within larger systems for communications, resource management, and automatic control.

In the design of a digital processing system, hardware and software must be considered as an integrated entity—software cannot be separated from hardware considerations. Thus, the computer engineer must be both a capable programmer and a capable hardware designer. The collective demands of computer engineering plus traditional electrical engineering encompass more knowledge than can be included in a single, highly structured degree program. The solution at Northeastern, as at many other schools, was to adopt a new undergraduate option within Electrical Engineering. The objective of this option is to provide the student with a basic and comprehensive knowledge of the principles that underlie the organization, design, and applications of digital processing systems. It encompasses both the hardware and software design aspects of the system and offers students the opportunity to acquire an understanding of the important relationships and "trade-offs" between the hardware and software components of a digital system. This understanding is necessary in order to create computer systems that satisfy the users' needs at prices they can afford.

The Computer Engineering option follows curriculum recommendations in the report "An Undergraduate Computer Engineering Option for Electrical Engineering" by the Cosine Committee of the Commission on Education, National Academy of Engineering, Washington, D.C. 20418 (January 1970). An important feature of this option is that it leads to a Bachelor of Science degree with specification—a degree in Electrical Engineering accredited nationally by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

Laboratories

The seven laboratory courses included in the program are an integral part of the educational process. Their purpose is both to supplement concepts developed in core courses and to introduce the student to design and experimental techniques.

To provide this facet of the educational experience, the Department has laboratory equipment in excess of \$1.5 million. In addition to standard professional laboratory equipment, several specialized laboratory facilities are maintained. These include several small digital computers such as a PDP-11, LSI-11, a number of CRT terminals, and a variety of microprocessors. Programming courses and research programs also use the large computer system at Northeastern's Computation Center.

The freshman-year program of studies in the College of Engineering is the same for all majors in the College. See page 161.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Calculus*	12	Calculus†	8
Physics*	12	Physics Lab†	2
General Chemistry*	8	L.A. Electives (2)†	8
English*	8	Math Analysis	8
Basic Engineering*	8	Social Science/Humanities	
Physics†	4	Electives	20

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Circuits and Systems I & II†	8	Electronics A & B	8
Circuits and Systems III & IV	8	Field Theory I & II	8
Discrete Systems	4	Material Science	4
Thermodynamics	4	Design and Organization of Digital Computers	4
Mechanics	4	Electronics C	4
Electrical Engineering Lab.	8	Electromechanical Dynamics	4
		Technical Electives (4)	16

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

The Electrical and Computer Engineering Department offers a wide variety of technical electives. These enable students to coordinate elective choices to satisfy their personal objectives of breadth or depth. To aid in selection, the elective courses are grouped by discipline.

Technical Electives**Electronic Circuits and Systems**

Selected Topics in Electronics
 Theory & Tech. of Semicond.
 Devices I
 Theory & Tech. of Semicond.
 Devices II
 Senior Project Labs
 Control Systems
 Communication Theory
 Math Techniques in E.E. I & II
 Numerical Methods & Computer
 Applications
 Digital Techniques

Electromagnetic Theory

Wave Transmission & Reception
 Advanced Topics in E & M
 Math Techniques in E.E. I & II
 Numerical Methods & Computer
 Applications
 Theory & Tech. of Semicond.
 Devices I & II
 Senior Project Labs

Computer Sciences

Numerical Methods & Computer
 Applications
 Digital Techniques
 Introduction to Digital
 Computers I & II
 Communication Theory
 Control Systems
 Math Techniques in E.E. I & II
 Selected Topics in Electronics
 Applied Discrete Analysis
 Machine & Assembly Language
 Programming
 Programming Systems
 Microcomputer-based Design
 Senior Project Labs

Systems Theory

Control Systems
 Communication Theory
 Math Techniques in E.E. I & II
 Numerical Methods & Computer
 Applications
 Digital Techniques
 Power Systems I & II
 Wave Transmission & Reception
 Senior Project Labs

**Power Systems Option Leading
 to B.S. Degree—5 years
 M.S. Degree—6 years**

Basic Course Requirements**I. General Requirements**

Course	Q.H.	Course	Q.H.
Calculus*	12	Calculus†	8
Physics*	12	Physics Lab†	2
General Chemistry*	2	Electives	8
English*	8	Math Analysis	
Physics†	4	Social Science/ Humanities Electives (6)	24

 II. Professional Requirements

Course	Q.H.	Course	Q.H.
Circuits and Systems I & II†	8	E. E. Power Lab.	4
Circuits and Systems III & IV	8	Math. Methods in E.E.	4
Thermodynamics	8	Nuclear Engineering	4
Electrical Engineering Lab	4	Technical Electives	4 or 8
Electronics A & B	8	Energy and Public Policy	4
Field Theory I & II	8	Linear Systems Anal.§	4
Transients in Power Systems	4	Anal. of Power Systems	4
Probability§	2	Seminars (2)§	4
Electromechanical Dyn. Mechanics	4	Power Systems Planning§	4
Machines and Systems	8	Special Topics in Power§	2
Electric Power Systems	8	Grad. Electives§	16
Professional Development	0	Computers in Power Systems§	4
		Electric Machine Theory§	2
		Electromagnetic Theory§	4

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

§Graduate courses, not needed for the B.S. degree.

Computer Engineering Option Leading to B.S. Degree—5 Years

Basic Course Requirements

 I. General Requirements

Same as general E.E. except for deletion of one 4-Q.H. required math analysis course and one 4-Q.H. arts and sciences elective.

 II. Professional Requirements

Same as general E.E. except for the deletion of one 4-Q.H. required E.E. course (Electromechanical Dynamics) and the addition of the following required courses:

Course	Q.H.	Course	Q.H.
Introduction to Digital Computers II	4	Machine Language and Assembly Language Programming	4
Programming Systems	4		

Industrial Engineering and Information Systems

Wilfred P. Rule, M.S., *Acting Chairman*

Professors

David R. Freeman, Ph.D.
Lewis H. Geyer, Ph.D.
Wilfred P. Rule, M.S.

Associate Professors

Franklyn K. Brown, M.S.
Richard I. Carter, M.S.
Thomas P. Cullinane, Ph.D.
Surendra M. Gupta, Ph.D.
Stewart V. Hoover, Ph.D.
Thomas E. Hulbert, M.S.
Robert S. Lang, M.S.
Ronald F. Perry, Ph.D.
Kenneth S. Woodard, M.S.

Assistant Professors

Geoffrey Berlin, Ph.D.
Martin Gardiner, Ph.D.
David S. Goldman, M.S.
Thomas J. Kerr, Ph.D.
Emanuel S. Melachrinoudis,
Ph.D.
Leszek Reiss, M.S.
David Rumpf, Ph.D.
Gerald Volland, M.S.

Instructors

James H. Bartlett, M.S.
Dinakar L. Nathan, M.S.
Rena L. Tobias, M.S.
Margaret J. Volland, M.S.

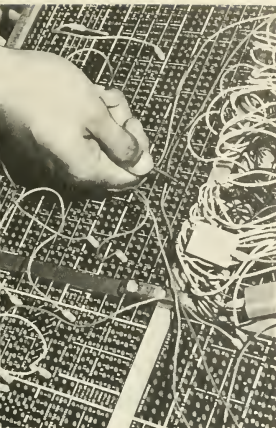
Professional Preparation

Aims Industrial engineers assist management in making decisions involving the utilization of individuals, materials, equipment, and energy to achieve the goals of an organization. Management needs factual information that defines the consequences of alternative decisions. The industrial engineer collects this information and evaluates alternatives to make the decision that best achieves a particular organizational goal. The scope of decisions may involve the entire organization or some portion of it associated with a given product or service.

Traditionally, industrial engineers have been most widely employed in manufacturing organizations, but increasingly they are finding employment in service industries, such as airlines, banks, hospitals, and local and federal government agencies. Courses in the curriculum reflect the industrial engineer's interest in society's changing attitudes about computers, population growth, pollution, and the quality of life.

Another responsibility of the Department of Industrial Engineering and Information Systems is to provide a comprehensive view of engineering. Students are confronted with several problems similar to those they may encounter in professional careers. Methods of problem solving and graphic representation of solutions are emphasized so that students have the opportunity to learn some of the ways engineers communicate through drawings and sketches. The role of an engineer as a creative designer is described by relatively large case studies that show the step-by-step solution to specially chosen problems cutting across several engineering disciplines.

Another important aspect of the Department curriculum is the area of computers. The Department offers courses to the entire University community in FORTRAN, COBOL, and Pascal. Courses in the application of microprocessors to process control are provided for students in the major. Each of these courses is heavily involved in applications to demonstrate the diverse ways in which the power of the computer may be applied to problems in areas such as engineering, social sciences, the humanities, and business.



Description of the Major In performing problem analyses, the industrial engineer is concerned with complex, integrated man-machine systems. To treat the machine elements of the system, the industrial engineer requires knowledge of engineering fundamentals. Also necessary is some background in the behavioral sciences to understand how the human elements of the system operate and how they relate to each other and the machines.

A View of the Five-Year Major The program is designed to include extensive course work in mathematics, physics, science, and the engineering sciences. The first two years provide the student the opportunity to build a strong foundation for use in later course offerings.

The required program affords students an opportunity to develop a strong base in probability, statistics, operations research, and computer systems. Courses in work design, personnel and organizational behavior, and engineering economy provide an exposure to the problems frequently encountered in industrial engineering. Elective offerings in the last few years provide an opportunity for students to familiarize themselves with other areas of industrial engineering, such as plant layout, quality control, simulation, management information systems, production and inventory control, and material-handling systems design.

The Computer Students are required to learn basic computer programming in their first year. In later years, they are asked to solve complicated problems by computer. The computer is of particular interest to the industrial engineer since many complicated problems, such as assembly-line balancing, mathematical modeling, and industrial simulations, require a computer solution.

Five-Year B.S.-M.S. Program

An accelerated program is available for honor students, allowing completion of the requirements for both B.S. and M.S. degrees in five years through course overloads starting in the third year and the elimination of the senior co-op term.

Laboratories

Integrated Laboratory The new Industrial Engineering Laboratory is an integrated lab used for a variety of different courses. Directly associated with the lab classroom are the computer console room, utilized in a variety of courses; the copying equipment for use in the plant layout courses; and the machine-tool lab for use in work design. Students work as individuals or in groups, depending upon the scope and complexity of the project. Extensive laboratory project work is also conducted on real problems in outside industrial plants and service organizations. Students can view actual operations on occasional plant visits.

Human Factors Laboratory Equipped primarily for experimentation in perception, the facility is used for demonstration and student projects.

Computer Laboratory Numerous minicomputers provide an opportunity for students to gain experience in operating a small computer and utilizing it for application to actual engineering problems. The facility also houses terminals for communication with the University computer system.

Microprocessor and Manufacturing Systems Lab A laboratory with microprocessors is available for hands-on programming experience in the use of microprocessors in engineering applications. Students may also develop small experimental situations in the use of microprocessors and minicomputers in a manufacturing environment. Robotics experience and study are offered.

The freshman-year program of studies in the College of Engineering is the same for all majors in the College. See page 161.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Calculus*	12	Physics†	4
Physics*	12	Physics Lab†	2
General Chemistry*	8	Economics I & II†	8
English*	8	Math Electives§	4
Basic Engineering*	8	Effective Speaking	3
Calculus†	8	Social Science/Humanities Electives	20

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Work Design*†	4	Personnel and Organizations	4
Engineering Science Elective†**	4	Engineering Economy and Statistical Decision Theory	4
Probability Analysis†	4	Engineering Science Electives (5)**	20
Statistics I & II	8	Technical Electives (4)††	16
Industrial Cost Control	4		
Operations Research	8		
Systems Analysis I & II	8		
Simulation	4		

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

§Differential equations or suitable offering of Math Department, with consent of the adviser.

**Five Engineering Science courses are required. They must include:

Principles of Computation and Programming I
Mechanics
Electrical Engineering I

The remaining courses may be selected from:

Principles of Computation and Programming II
Electrical Engineering II
Mechanics II
Flow of Fluids
Thermodynamics I
Materials Science
Microprocessor Programming

††Four Technical Electives are required. Two must be Industrial Engineering electives:

Production Planning
Facilities Design
Quality Control
Management Information Systems
Human Factors
Industrial Relations
Human Considerations in Design
Data Base Management
Microprocessors
Material Handling Systems

Mechanical Engineering

Charles A. Berg, Sc.D., *Professor and Chairman*

Professors

John W. Cipolla, Jr., Ph.D.
John F. Dunn, Sc.D.
Arthur R. Foster, M.Engr.
Welville B. Nowak, Ph.D.
D. Smith Professor of Engineering
John N. Rossettos, Ph.D.
Joseph J. Zelinski, Ph.D.

Associate Professors

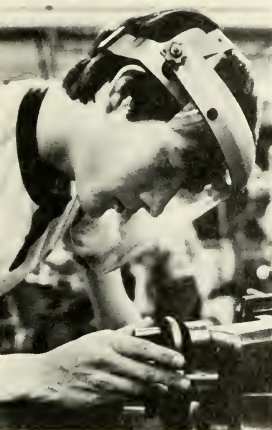
George G. Adams, Ph.D.
Ralph S. Blanchard, M.S.
Alexander M. Gorlov, Ph.D.
Bertram S. Long, M.Engr.
Ernest E. Mills, M.S.
Richard J. Murphy, Ph.D.
Uichiro Narusawa, Ph.D.
Warren G. Nelson, Sc.D.
Yaman Yener, Ph.D.
Alvin J. Yorra, M.S.
John Zotos, Met. Engr.

Assistant Professors

Hamid Nayeib Hashemi, Ph.D.
Gregory J. Kowalski, Ph.D.
Gregory J. Kowalski, Ph.D.
Mohamad Metghalchi, Ph.D.
Robert L. Sullivan, Jr., M.S.
Mohammad E. Taslim, Ph.D.
John L. Williams, Ph.D.
Ibrahim Zeid, Ph.D.

Instructors

Mohammad Ohadi, M. Engr.
Mohammad Shishesaz, M.S.
Kenneth A. Tepper, Ph.D.



Professional Preparation

Aims Mechanical Engineering is the branch of science broadly concerned with energy, including its transformation from one form to another, its transmission, and its utilization. Mechanical engineers conceive, plan, design, and direct the manufacture, distribution, and operation of a wide variety of devices, machines, and systems—including complex man-machine systems—for energy conversion, environmental control, materials processing, transportation, materials handling, and other purposes.

Mechanical engineers are engaged in all the engineering functions, including creative design, applied research, development, production, and management. The field of mechanical engineering is broad, providing an excellent professional base for career choice and interdisciplinary activities.

Description of the Major The curriculum is intended to accommodate changing demands on the mechanical engineer by offering a firm foundation in the basic sciences before students direct their studies toward a chosen area of interest.

A View of the Five-Year Major In the first three years, students have the opportunity to learn the basic sciences (mathematics, physics, and chemistry), the engineering sciences (mechanics, thermodynamics, fluid mechanics, and material science), and the humanities. As upper-classmen, they may choose to concentrate their studies in the areas of thermofluid engineering, mechanics and design, or materials science and engineering.

Thermofluid engineering is concerned with the properties and characteristics of the working fluid of machines. For example, the ability of an aircraft to fly depends upon the manner in which air flows over its lifting surfaces. The energy to run a turbine is extracted from the steam or combustion gases that pass through it. The engineer must understand and have a knowledge of the concepts of thermodynamics. The efficiency of a cooling tower depends upon the mechanisms by which fluids transfer heat to surfaces, so the engineer must have a firm grasp of the principles of heat transfer.

Mechanics and design are based upon the fundamental scientific and mathematical tools utilized in the analysis of mechanical configurations as they evolve in the design of machines and power-producing devices. For example, the engineer in the area of mechanics and design may analyze and design structural components for power plants and deep-sea oceanographic vessels or develop new methods for evaluating filamentary composite structures. In the modern machine-tool industry, engineers may be concerned with computer control of machine tools; in the engine industry, they may analyze stresses in components such as turbine blades. To prepare for such challenges, upperclass students have the opportunity to expand their basic knowledge by selecting courses such as Intermediate Strength of Materials, Vibrations, Systems Analysis and Control, Engineering Analysis, Design Fundamentals, and Computer-Aided Design.

Materials science and engineering is concerned with relationships among the structure, composition, properties, and functions of materials and with control of the structure and composition to achieve desired properties. Only recently have engineers come to realize that an understanding of the principles of materials science enables them to design more creatively and with greater freedom than the traditional reference to handbooks. Examples of areas in which mechanical engineers find materials properties a part of the basic design function include: manufacturing techniques, structures (vehicles, buildings), energy conversion, electronic devices (including computers), packaging, and prosthetic devices. Advanced courses are available for those mechanical engineers who desire further knowledge in the materials field.

Five-Year B.S.-M.S. Program

Honor students may taken an accelerated program allowing completion of the requirements for both B.S. and M.S. degrees in five years through course overloads starting at the third year and the elimination of the senior co-op term.

Special Information

Mechanical Engineering Laboratories The laboratories in Mechanical Engineering contain equipment ranging from an electron microscope and ultrasonic measuring devices to pumps and weirs. Students working on thermofluids projects may use a turbine, various types of engines, thermoelectric coolers and generators, and a supersonic wind tunnel, to name a few. A material science laboratory provides research microscopes, various furnaces, a fluid-to-fluid extrusion press, X-ray diffraction equipment, electron microscope, and other related equipment. For the mechanics and design areas, vibrations, experimental stress analysis, and materials testing facilities are provided. A continuous effort is made by the Department to update and replace laboratory equipment.

Computers A Computervision CAD/CAM system has recently been installed to allow students hands-on experience in this rapidly emerging technology.

The freshman-year program of studies in the College of Engineering is the same for all majors in the College. See page 161.



Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
English*	8	Physics†	4
General Chemistry*	8	Physics Lab†	2
Basic Engineering*	8	Math. Analysis	8
Calculus*	12	Social Science/Humanities	
Physics*	12	Elective	4
Calculus†	8	Economics†	4

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Mechanics I & II†	8	Measurement & Analysis	4
Thermodynamics I†	4	Fluid Mechanics	4
Thermodynamics II	4	Materials Science	9
Mechanics III & IV	8	Design	12
Heat Transfer	4	Electrical Engineering	4
Dynamics	4		

Junior and Senior Years

Twelve technical courses are taken by juniors and seniors in addition to four social science/humanities electives. Elective offerings are subject to some departmental restrictions. Students should obtain the latest departmental booklet describing these restrictions and current course offerings.

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

Biomedical Engineering

Samuel Fine, S.M., M.D., *Professor and Chairman*

Associate Professor

H. Frederick Bowman, Ph.D.

Professional Preparation

Aims Biomedical engineering is concerned with the scientific principles underlying the physical and biological sciences and their application to problems of biological and medical significance.

Biomedical engineers are engaged in both theoretical and experimental studies either as independent investigators or as members of a research or development group. They may characterize and determine the mechanism of action of natural and synthetic macromolecules, analyze the properties of blood, and/or investigate the structure and function of such organ systems as the nervous system, the respiratory system, the cardiovascular system, or the endocrine system. They may design, develop, market and apply transducers, cardiac pacemakers and defibrillators, heart-assist systems, artificial kidneys and limbs, or diagnostic and therapeutic X-ray equipment. They are important members of the hospital health team.

There is no special curriculum in Biomedical Engineering. Several of the engineering disciplines discussed in this catalog help provide the engineer with a background in the physical sciences. The purpose of the Biomedical Engineering Department is to assist the engineering student, from the freshman year through the senior year, in choosing courses in the biological sciences to complement those in the physical sciences and humanities taken in the standard engineering curriculum.

Courses may be chosen without prejudicing the students' obtaining degrees in their field of engineering specialization. In some cases, courses in the biological sciences can be taken as additional work during the student's career at the University. In other cases, courses in the biological sciences can be taken as electives in the standard engineering curriculum. The opportunity to take these courses is dependent on the student's interests, capabilities, and academic record. It is, of course, limited by possible schedule conflicts.

Students who wish to take an engineering program that includes biological sciences must contact the Biomedical Engineering Department on their arrival as freshmen at the University. This is important since biology is substituted in the first year for graphics.

Education in a program involving the physical and biological sciences offers a sound foundation for future work toward a doctorate in medicine or dentistry, a career in biomedical engineering, or a career as an engineer in a hospital or a government agency such as the Department of Health and Human Services, depending upon such factors as the state of the economy and the student's own industry and overall ability. Industrial organizations, particularly those in the health-care industry, may be seeking individuals with a strong background in engineering supplemented by a biological science education. Other career opportunities may include public health, the psychological sciences, and the marine sciences.

General Engineering Program

Advisory Committee for 1983-1984

Thomas E. Hulbert, M.S., *Industrial Engineering, Chairman*

Arvin Grabel, Sc.D., *Electrical Engineering*

Saul Namyet, B.S., *Civil Engineering*

Richard R. Stewart, Ph.D., *Chemical Engineering*

Alvin Yorra, M.S., *Mechanical Engineering*

Professional Preparation

Aims Engineering and technology influence virtually all areas of endeavor and have a profound effect on the lifestyle and institutions of society. The impact is both cultural and scientific and is manifested by the awareness that solutions to society's problems are, in part, technological. The major purpose of the General Engineering program is to provide flexible, interdisciplinary educational opportunities based on fundamental engineering concepts. The interdisciplinary nature of the program allows the student to develop other areas of interest in which an engineering background is professionally useful.

Description of the Major The program is designed for students whose interests are in engineering-related professions rather than in the traditional profession of engineering. It is expected that the work performed by graduates of this program will encompass the entire spectrum of professional activity, including such typical areas as computers, urban technology, social systems, and health care.

The General Engineering program is highly elective and gives students the opportunity to develop, in conjunction with their adviser, a program designed to meet their own career objectives. To achieve this goal, the student is exposed to the fundamental engineering areas through courses in electric circuits, systems, mechanics, thermodynamics, and materials. These courses are based on principles developed in early courses in mathematics and physics. In addition, because the computer is a basic tool in any technological environment, each student is required to learn the elements of computer programming. Students completing the adviser-approved program receive an unspecified B.S. degree from the College of Engineering.

Graduate education and continuing education are increasingly important in professional life. By appropriately planning their programs, students will be able to satisfy the course requirements necessary for admission to various graduate and professional schools, including law, medicine, public health, and social sciences, as well as engineering.

A View of the Five-Year Major Each student in the program is required to satisfy the following minimum requirements beyond the freshman year:

- 8 quarter hours in mathematics
- 6 quarter hours in physics (including laboratory)
- 4 quarter hours in circuit theory
- 4 quarter hours in materials
- 4 quarter hours in systems
- 4 quarter hours in thermodynamics
- 16 quarter hours in social sciences (consisting of at least two sequences of two courses each from the areas of sociology, economics, political science, and psychology)
- 8 quarter hours in the humanities, consisting of at least two courses from the areas of art, history, language and literature (not including grammar), music, philosophy, and drama (not including public speaking)

The remaining portion of the program is completely elective but must be designed to fit the student's career objectives. At least 24 quarter hours of course work must be taken in the professional departments of the College of Engineering (Chemical, Civil, Electrical and Computer, Industrial and Information Systems, and Mechanical Engineering).

Beyond the freshman year, students, in conjunction with a faculty adviser, plan their programs. Basically, the elective program permits each student to plan a distinctive and highly individual curriculum.

Although each student is enrolled in a "different program," the goals of each are the same: the breadth of an engineering-based liberal education in combination with the development of professional skills.



Lincoln College

Thomas E. Hulbert, M.S., P.E., *Director, Associate Dean of Engineering*

Jacob Wiren, M.S., P.E., *Assistant Director*

Rasma Galins, *Assistant to the Director*

Richard D. Mansfield, B.S., *Assistant to the Director*

Joyce M. Reppetto, B.A., M.Ed., *Counselor*

Professor

Israel Katz, M.S., *Engineering Technology*

Associate Professors

Borah Kreimer, M.A., *Engineering Graphics*

Ernest E. Mills, M.S., P.E., *Mechanical Engineering Technology*

Louis J. Nardone, M.S., P.E., *Electrical Engineering Technology*

Thomas E. Phalen, M.S., P.E., *Mechanical Engineering Technology*

Assistant Professor

Nonna Lehmkuhl, M.S., *Computer Technology*

Professional Preparation

Aims Lincoln College offers programs in engineering technology. Although these programs are concerned with the same general fields of engineering specialization, they concentrate on the applications of technology rather than its development.

Emphasis is placed on the rational processes involved in converting theories and ideas into practical techniques, procedures, and products. The engineering technologist works with the professional engineer, scientist, medical doctor, supervisor, and craftsman in converting scientific knowledge and craftsmanship into products and techniques. Fundamentals are related to current practice, providing a supportive "why" for the practical "how." At the same time, study of the humanities and social sciences gives students an opportunity to develop an awareness of the social, economic, and political influences that are part of the real world.

The structure of the Engineering Technology curriculum is based upon the dual need for relevant technical skills and a foundation for future growth. Engineering technology education can assist students to:

1. Understand the scientific principles that govern the current technology of the particular branch of engineering that they select
2. Develop competence in the application of technology to problem solving
3. Communicate effectively the important implications of technological advancements
4. Acquire the motivation for continued development of technical skills

A View of the Five-Year Program Lincoln College offers five-year cooperative programs in Mechanical and Electrical Engineering Technology, and Computer Technology leading to the degree of Bachelor of Engineering Technology.

Since the first year of study is similar for all technology students, a firm choice of major may be delayed until the spring. At this time, the choice of cooperative work assignments makes a decision mandatory. Freshman courses act as a foundation for upperclass studies. About four-

fifths of the upperclass program is devoted to scientific and technological study and about one-fifth to humanistic-social courses, with the aim of balancing technical proficiency with an appreciation for the nontechnical aspects of society and culture. Cooperative work assignments during the upperclass years are most valuable in helping students to integrate the important elements of both a technical and a liberal education.

Transfer Aerospace Co-op Program Lincoln College is offering for transfer students, a three-year Bachelor of Engineering Technology degree program with a major in Aerospace Maintenance Engineering Technology. This BET program, in cooperation with East Coast Aero Technical School, is designed for students who have successfully completed an Aircraft and Power Plant Mechanics or similar programs. During their three years of study at Northeastern University these students will participate in the Cooperative Education system thereby enhancing the technical classroom education received.

Part-Time Program Offered During Evening Hours Lincoln College also offers seven-year, part-time curricula leading to the degree of Bachelor of Engineering Technology in the following areas:

- Civil Engineering Technology
- Mechanical Engineering Technology
- Mechanical-Structural Engineering Technology
- Electrical Engineering Technology
- Computer Technology

Classes are held in the evenings and on Saturday mornings. For further information on admission to these programs, contact the Lincoln College office at 408 Churchill Hall.

Graduation Requirements

Candidates for the Bachelor of Engineering Technology degree must complete all of the prescribed work of the curriculum in which they seek to qualify. A total of approximately 180 quarter hours is required for the degree. Students who undertake the cooperative education program must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

Students transferring from another college or university are not eligible to receive the degree until they have completed at least one academic year at Northeastern immediately preceding their graduation.

Graduation with Honors

Baccalaureate candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University at least six academic quarters and have earned a minimum of 72 quarter hours of credit before they may become eligible for honors at graduation.

Accreditation

Both the Electrical and Mechanical Engineering Technology baccalaureate day programs, as well as the evening part-time baccalaureate programs in Mechanical, Mechanical-Structural, Civil, and Electrical Engineering Technology, are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), formerly the Engineer's Council for Professional Development.

Facilities

The Northeastern electrical engineering laboratories are patterned after a composite of typical industrial research and development laboratories. Boasting a wide variety of modern testing and measuring equipment, the laboratories are an excellent adjunct to the classroom. Here, students may simulate or fabricate devices or systems that have been studied in their lecture courses.

From light machinery and power equipment to microwave precision systems, students plan and pursue their projects in the laboratory. Four LSI-11 Digital Equipment computers are available in the laboratories for direct programming or use in other laboratory experimentation. In addition, several varieties of microprocessors and associated equipment are used in student laboratories.

The Mechanical Engineering Department includes the following laboratories.

Materials and Metallurgy Laboratories—Equipped to treat the physical examination of materials and their structures. The equipment includes modern apparatus for vacuum melting technology, X-ray diffraction, and thermal expansion studies; two research metallographs; scanning and transmission electron microscopes; and fluid-to-fluid extrusion press.

Fluid and Gas Dynamics Laboratory—Designed to study aerodynamic and hydrodynamic phenomena such as vortices, separation streamlines, and shock waves. Equipment includes an aerodynamalog, an axial flow fan, shock tube, subsonic wind tunnel, and supersonic wind tunnel.

Materials Testing and Stress Analysis Laboratories—Equipped to handle both the destructive and nondestructive testing of materials. This laboratory has a 300,000-pound Universal testing machine with an automatic electronic stress-strain recorder and high-temperature tensile test furnace. Stresses and strains may be determined experimentally by the use of strain-gage, photoelastic, photostress, and brittle-lacquer techniques.

Recent additions include vibration-testing units and a fatigue-testing machine with a 2,000-pound capacity.

Heat Engineering Laboratories—Include a refrigeration unit, which may also operate as a heat pump; two solid injection diesel engines provided with a continuous oxygen analyzer, one equipped with a strain-gage torque meter; a CFR fuels-research engine equipped with a strain-gage pressure transducer; a 60-h.p. Rover gas turbine with automatic controls and Froude dynamometer; apparatus for study of steam-to-water heat transfer, comparison of film versus dropwise condensation, heat transfer to a boiling liquid, and thermocouple recovery factor; a thermoelectric generator to study the direct conversion of heat into electrical energy; a thermoelectric-refrigeration test facility for development of single and multistage thermoelectric coolers; and a Curtis steam turbine and condenser.

Automatic Control Laboratory—Includes a feedback control system and analog computers for simulating engineering problems, and fluid power testing units.

Academic Computer Services

The Northeastern University Computation Center is a support arm to the many computer-oriented curricula of the various departments throughout the University. The facility recently has been updated with the instal-

lation of a third powerful Digital Equipment VAX series system with time-sharing capability. As the prime computation center necessary in meeting curriculum requirements, the Center is used by the students in the Electrical Engineering Technology, the Mechanical Engineering Technology, the Aerospace Maintenance Engineering Technology, and the Computer Technology programs.

Women in Engineering Technology

Many women enter the technology field each year. Both government and industry provide positions of responsibility for women technologists. Any woman with technical or scientific interests should consider engineering technology as a career.

The freshman-year program of studies in Lincoln College is similar for all majors in the College.

Sample Freshman-Year Program of Studies in Engineering Technology

First Quarter

Algebra and Trigonometry I
Physics I
English/Writing
Engineering Design Graphics I

Third Quarter

Calculus I
Physics III
English/Literature
Physics Lab II
Engineering Design Graphics II/
Electronic Graphics*

Second Quarter

Algebra and Trigonometry II
Physics II
English/Literature
Computer Programming for
Engineering Technology*
Physics Lab I

**Computer Technology students take Introduction to Programming, Basic Computer Organization*

In addition to the above courses, students may elect to take Basic ROTC.

Electrical Engineering Technology

Louis J. Nardone, M.S., *Coordinator for Electrical Engineering Technology*

Professional Preparation

Aims Because the Bachelor of Engineering Technology (BET) program has been designed to provide trained people for ready assimilation by the engineering field, its main thrust is not aimed at preparing the student for direct admission to the graduate schools of engineering.

However, for the student who achieves above-average grades, the BET program can be an avenue of admission to the College of Engineering via several options. Students who desire to explore this possibility should contact their freshman adviser or the Director of Lincoln College. In most other cases, graduates of the BET program will be

eligible for graduate programs other than engineering, such as business, law, or education.

Description of the Major Electrical engineering technology deals with the design and operation of equipment and systems related to power, communications, data processing, and electrical control. Its major functions include:

1. The generation, transmission, and distribution of electrical energy for light and power purposes
2. The development and production of equipment for telephone, radio, television, radar, and communication
3. The design and construction of data-processing systems and analog or digital computers
4. The application of electrical and electronic devices in the control of processes and manufacture.

A View of the Five-Year Major Since electrical engineering technology derives many of its fundamentals from developments in the pure sciences, the program of study begins with basic courses in mathematics and physics. In addition, the freshman year includes literature and engineering graphics to aid students in developing the skills with which to express themselves.

In the upperclass years, courses are divided into four related sequences: circuits and systems, including feedback control; microwave devices; energy conversion, emphasizing electromagnetic devices; and laboratory work associated with all of the aforementioned. Current practice is stressed.

In the senior year, electives are offered to ensure that students acquire both depth and specialization.

The freshman-year program of studies in Lincoln College is similar for Electrical and Mechanical Engineering Technology. See page 187.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Algebra and Trigonometry I & II*	8	Computer Programming for Engineering Technology*	4
Calculus I*	4	Physics I, II, III*	12
Calculus A & B†	8	Physics Lab I & II*	4
English*	12	Social Science/Humanities Electives	8
Principles of Economics	4	Social Science/Humanities Electives	12
Engineering Design		Technical Electives	16
Graphics I*	4		
Electronic Graphics	4		

 II. Professional Requirements

Course	Q.H.	Course	Q.H.
Circuit Analysis I & II†	8	Digital Computers I & II	8
Circuit Analysis III & IV	8	Distributed Systems	4
Electronics I, II, III	12	Circuits Lab I†	2
Control Engineering I & II	8	Circuits Lab II	2
Engineering Analysis I	4	Electronics Lab	2
Energy Conversions	4	Advanced Electronics	
Electrical Measurements	4	Lab I, II, III	6
Mechanics	4	Pulse and Digital I	4

*Courses are taken in the freshman year.

†Courses are taken in the sophomore year.

Mechanical Engineering Technology

Ernest E. Mills, M.S., *Coordinator for Mechanical Engineering Technology*

Professional Preparation

Aims The objectives of the program are the same as those listed for the Electrical Engineering Technology program.

Description of the Major Mechanical engineering technology deals with the use of machinery to harness power resources and perform useful work. In contrast to civil engineering, which deals primarily with static forces and structures, mechanical engineering is more concerned with the motion and kinetics of devices activated by hydraulic, electrical, mechanical, or thermodynamic forces. Major functions of the mechanical engineering technologist include:

1. Design and installation of all kinds of machinery, from pocket watches to the largest steel boring mills
2. Development and production of engines and transport equipment, as in automobiles, aircraft, ships, or railway cars
3. Construction and operation of furnaces and boilers, as well as heating and air-conditioning equipment, for the control of atmospheric and environmental conditions.

A View of the Five-Year Major Since machinery is the predominant concern of the mechanical engineer, the program of study is designed to offer considerable training in the principles underlying the design and operation of engines, power transmission devices, machine tools, and other machinery. This, of course, implies a thorough study of the physical laws concerning motion and transfer of energy. Applied mechanics, thermodynamics, and study of materials will occupy prominent places in the program.

These studies help provide the student with a broad foundation in those fundamental subjects essential to the understanding of current practice. In the junior and senior years, students have considerable elective choice and opportunity for specialization.

The freshman-year program of studies in Lincoln College is similar for Electrical and Mechanical Engineering Technology. See page 187.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Algebra and Trigonometry I & II*	8	Physics Lab I & II*	4
Calculus I*	4	Engineering Design Graphics I, II	8
Calculus A, B†	8	Computer Programming for Engineering Technology	4
English*	12	Social Science/Humanities Electives	20
Principles of Economics	4	Technical Electives	15
Physics I, II, III*	12		
Engineering Economy	4		

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Mechanics A, B†	8	Mechanical Design A, B	8
Mechanics C	4	Thermodynamics A, B, C, D	14
Stress Analysis A†	4	Fluid Mechanics A & B	6
Stress Analysis B	4	Transfer Labs ABCDE	10
Materials A	4	Refrigeration and Air Conditioning	4
Engineering Design	4	Machine Shop	4
Electricity and Electronics I	4		
Measurement and Analysis Lab A	2		

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

Computer Technology

Nonna Lehmkuhl, M.S., *Coordinator for Computer Technology.*

Professional Preparation

Aims The objectives of the program are the same as those listed for the Electrical Engineering Technology program.

Description of the Major Computer technology deals with the design and application of equipment and systems related to the hardware and software aspects of computers. Its major functions include:

1. Interfacing the computer with process plants or machinery
2. Programming the computer for engineering, scientific, and business applications
3. Designing, engineering, and testing computers
4. Interfacing computers to various types of equipment for automatic drafting, data collection, design, and display.

A View of the Five-Year Major The present-day high-speed computers have been realized through the application of technology developed in the electrical and the electronic field. Because of this interdependence, the program of study for Computer Technology begins, as in Electrical Engineering Technology, with the basic courses in Mathematics and Physics.

An introduction to computer programming and the study of basic computer organization provide an early contact with the major field of study. In addition, the freshman year includes literature and engineering graphics to aid students in developing the skills to express themselves.

In the upperclass years the balance of hardware and software courses, combined with hands-on laboratory experience, provides the student with the opportunity to develop skills for interfacing the computer with various systems or to design computers and the related systems of programs. Current practice is stressed.

The senior year electives are offered to ensure that students acquire both depth and specialization.

The freshman-year program of studies in Lincoln College's Computer Technology major is the same as for the Electrical or Mechanical Engineering Technology, with the exception of courses 09.405 Introduction to Programming and 09.450 Basic Computer Organization. These courses are taken in place of courses 09.400 Computer Programming for Engineering Technology and 09.471 Engineering Design Graphics II.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Algebra and Trigonometry I, II*	8	Physics Lab. I & II*	2
Calculus I*	4	Engineering Design Graphics I*	4
Calculus A, B†	8	Introduction to Programming*	4
English*	12	Social Science/Humanities Electives	16
Principles of Economics†	4	Technical Electives	16
Physics I, II, III*	12	Basic Computer Organization*	4

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Circuit Analysis I, II	8	Advanced Computer Organization	4
FORTRAN	4	CPU Hardware Architecture	4
Semiconductor Logic Electronics I	4	Non-Numerical Algorithms	4
Modern Programming Techniques	4	Micro-Peripheral Hardware	4
Computer Logic	4	Numerical Algorithms	4
COBOL	4	Data Communications Methods	4
Assembly Language	4	Industrial Software	4
Introduction to CPU Hardware	4	Industrial Hardware	4
		Computer Peripheral Hardware	4

*Usually taken in the freshman year.

†Usually taken in the sophomore year.

College of Nursing

Juanita O. Long, R.N., M.S.N., Ed.D., *Dean*

Joan Grindley, R.N., M.S.N., Ed.D., *Associate Dean*

Adele I. Law, R.N., M.S.N., *Assistant Dean*

Angelo J. Logiudice, M.Ed., C.A.G.S., *Assistant to the Dean*

Associate Professors

Jane Aroian, R.N., M.S.N.

Olivia M. Breton, R.N., M.Ed.

Elaine Capozzoli, R.N., M.A.

Janet Carroll, R.N., M.S.

Teresa Chopoorian, R.N., Ed.D.

Ellen T. Daly, R.N., M.S.N.

Flora M. DeScenza, R.N., M.S.

M. Paula Fellows, R.N., M.S.

Jean P. Gilbert, R.N., M.S.

Mary C. Keaney, R.N., M.S.N.,
C.A.G.S.

Jane M. Lee, R.N., M.S.

M. Marcia Lynch, R.N., M.S.

Susan C. Marchessault, R.N.,
M.S.

Geraldine A. Medici, R.N., M.S.

Marilyn M. Smith, R.N., M.S.,
M.B.A.

Joyce E. Tingle, R.N., M.S.

Nancy Walden, R.N., M.S.N.

Mary E. Wilcox, R.N., M.S.

M. Delaine Williamson, R.D.,
M.S.

Assistant Professors

Nancy N. Carr, R.N., M.S.

Sally J. Cloutterbuck, R.N.,
M.S.N.

Lael T. Cutler, R.D., M.P.H.

Nancy E. Lyga, R.N., M.S.

Joan L. Mamelok, R.N., M.S.

D. Jeanne Otto, R.N., M.S.,
M.Ed.

Diane W. Porter, R.N., M.S.

Patricia S. Williams, R.N., M.S.

Eve Ellen Wise, R.N., M.S.

Karen A. Wolf, R.N., M.S.

Instructors

Jane Armstrong, R.N., M.S.N.

Annette P. Gaines, R.N., M.S.

Kelly Mayo, R.N., M.S.N.

Professional Preparation

Aims First in the nation to operate on a cooperative plan, the College of Nursing was established at Northeastern University in 1964.

The generic baccalaureate degree program is five years in length and leads to the degree of Bachelor of Science in Nursing. The program is designed to offer students the opportunity to prepare themselves for positions as beginning professional practitioners, giving nursing care in a variety of patient-care settings, and to obtain the foundation for graduate study.

Opportunities for Registered Nurses The College of Nursing accepts Registered Nurses who wish to complete requirements for the Bachelor of Science degree in Nursing as full-time day or part-time evening students.

The length of the program depends upon the individual's interest and ability to achieve advanced placement. Applicants whose knowledge of subject areas has been obtained through actual experience, previous educational preparation, or individual study are encouraged to apply for credit through the advanced placement process. This opportunity is available for most of the nursing and nonnursing courses. Tests prepared by Northeastern University faculty, National League for Nursing, and C.L.E.P. (College Level Examination Program) may be utilized.

A View of the Nursing Program In common with the other Basic Colleges at Northeastern, the College of Nursing operates on the cooperative plan. In addition to college instruction, each student has the opportunity to obtain practical experience as a paid employee of one of the cooperative health-care agencies. The work does not carry academic credit, but it must be satisfactorily completed. During periods of employment, students have the opportunity to increase nursing skills and gain significant experience in nursing settings, as well as earn money to help defray expenses.

The College of Nursing program offers general education courses concurrently with nursing courses to provide the educational foundation for the practice of nursing. Required courses for the Nursing major are planned in sequential order and draw on content from the physical, biological, and social sciences and from the humanities.

Freshmen remain on campus for three consecutive quarters of academic study, while students in succeeding years alternate periods of study at Northeastern with periods of cooperative work experience in participating health agencies.

Cooperative work placements are arranged by a nursing coordinator in accordance with agreements made by the University and a number of hospitals in the Greater Boston area and surrounding communities. Cooperative work experience is a requirement for the degree except for the experienced registered nurse students. Student preferences as to assignment will be given consideration in conjunction with other factors.

Under the guidance of the College of Nursing faculty, clinical experience in the care of patients is introduced during the second year of the program. Approximately thirty outstanding hospitals and health-related agencies are utilized to provide facilities for clinical laboratories.

Graduation Requirements

Degrees A Bachelor of Science in Nursing degree is awarded upon completion of the program. All candidates must successfully complete all the prescribed courses, and generic students must complete the prescribed periods of cooperative work. One hundred and seventy-nine quarter hours are required for the Bachelor of Science degree. An overall minimum scholastic average of C in both nursing and general studies is required for graduation.

Graduation with Honors

Candidates for the Baccalaureate degree who have attained superior grades in their academic work will be graduated with honors (3.0 GPA). Upon special vote of the faculty, a limited number of this group are graduated with high honors (3.5 GPA) or highest honors (3.750 GPA). Students must attend the University at least six quarters to become eligible for honors at graduation.

Accreditation

The program of the College of Nursing is fully accredited by the National League for Nursing and approved by the Board of Registration in Nursing of the Commonwealth of Massachusetts.

Licensure

The program of the College of Nursing is designed to prepare graduates to qualify to take the professional examination established by the Board of Registration in Nursing. Graduates are expected to take this examination for licensure as a registered nurse when the examination is first offered after graduation.

Acceleration Policies

Enrolled students who wish to accelerate must satisfy the following criteria:

Students should have a minimum of sixty quarter hours of credit completed prior to entrance into Northeastern University's College of Nursing. These credits must be transferable toward the degree requirements.

Students must have achieved a cumulative average of 3.0 or better in the following nursing courses: 80.217, 80.218, 80.219, 80.220, and 80.221.

Life experience in health-related fields will be examined to ascertain whether these meet the established objectives of cooperative nursing education. A student may petition to be exempt from a maximum of three cooperative experiences.

Rotation into a clinical nursing course is contingent upon available openings in the course. Students accelerating in nursing courses will be required to meet the existing promotional policies. All students receiving a degree from Northeastern must be in residence for one year.

Students will be allowed to transfer credits earned in courses at other institutions if a grade of C or better has been obtained and if the descriptions of the courses taken are comparable to courses required at Northeastern University.

Special Requirements

Students in the College of Nursing are required to wear the school uniform in clinical laboratory areas during academic quarters. A modification of the uniform is worn during cooperative work periods.

All students must carry malpractice insurance. Arrangements for this insurance are made by the University.

Health Clearance Every student must have a complete physical examination and rubella titre prior to admission to the College of Nursing.

Sample Freshman-Year Program of Studies in the Nursing Program

First Quarter

Biology
Western Civilization
English
Nursing

Third Quarter

General Chemistry
Anatomy
Western Civilization
Human Nutrition

Second Quarter

General Chemistry
Biology
English
Nursing

NOTE: Current requirements are now being revised. Information concerning new requirements may be obtained from the Office of the College of Nursing, 102 Robinson Hall.

Basic Course Requirements: Baccalaureate Degree**I. General Requirements**

Course	Q.H.	Course	Q.H.
Biology*	8	Fundamentals of Psychology I & II†	8
Western Civilization*	8	Social Anthropology†	4
English*	8	Principles of Sociology**	4
General Chemistry*	10	Social Psychology**	4
Anatomy*	4	Electives (6)	24
Microbiology†	4	(includes 8 Q.H. of Humanities)	
Physiology†	8		

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Nursing*	8	Maternal-Child Nursing	9
Human Nutrition*	4	Psychiatric-Mental Health Nursing**	7
Nursing†	12	Community Health Nursing	9
Growth and Development I & II**	8	Contemporary Nursing	9
Pharmacology**	3		
Nursing**	7		
Medical-Surgical Nursing	9		

*These courses are usually taken in the freshman year.

†These courses are usually taken in the sophomore year.

**These courses are usually taken in the third year.



College of Pharmacy and Allied Health Professions

Gerald E. Schumacher, Pharm. D., Ph.D., *Dean*

Judith T. Barr, M.Ed., *Associate Dean*

John L. Neumeyer, Ph.D., *Director, Graduate School of Pharmacy and Allied Health Professions*

Joseph F. Palumbo, M.S., *Assistant to the Dean for Student Affairs*

Steven H. Tierney, Ed.D., *Assistant to the Dean for Student Affairs*

Kathleen T. Foley, A.S., *Assistant to the Dean*

Theresa Perry, Ed.D., *Coordinator, Health Careers Opportunity Program*

Professional Preparation

Aims Northeastern University recognizes the increased demand for well-educated pharmacists and allied health professionals. The College of Pharmacy and Allied Health Professions is pledged to meet this need through a unique combination: the Cooperative Plan of Education and a highly innovative academic program designed to offer students the opportunity to prepare themselves to become effective professional practitioners, to enter graduate schools, and to obtain employment in the many areas responsible for the delivery of health care.

A View of the Five-Year Program Fundamental to the College's approach to health-care education are:

1. A curriculum of highly relevant and closely integrated courses in the physical, biological, behavioral, and administrative sciences comprising the basis of modern professional practice;
2. A meaningful involvement in the clinical aspects of patient care via affiliations with teaching hospitals and related institutions;
3. A cooperative work program, including an externship-internship period, and a clinical component offering students the opportunity to acquire the skills and actual experience integral to the total program;
4. A commitment to the search for and advancement of new and progressive concepts, ideas, and philosophies of education and professional practice.

Facilities

The College occupies the Mugar Life Sciences Building on the main campus of the University. Completed in 1963, this multimillion-dollar facility offers proximity to all the academic and extracurricular activities of the University.

The building and the Amelia Peabody Health Professions Center addition, with its well-equipped laboratories and classrooms for both undergraduate and graduate programs, are designed to anticipate the physical needs of a growing and progressive College. In addition to faculty and administrative offices, a Drug Information and Resource Center, a data-processing area, and the graduate school, there are laboratories for radioisotopes, clinical chemistry, medicinal chemistry, drug analysis, prescription pharmacy, hematology, immunology, pharmacology, respiratory therapy, medical record science, and clinical microbiology. Animal rooms and audiovisual capabilities for all programs are also featured in this five-story structure. Research facilities are available for upperclass students who participate in original research projects.

Transfers with Advanced Standing

The College of Pharmacy and Allied Health Professions may accept qualified transfer students who have successfully completed one or more years of preprofessional course work in an accredited college or university.

Degrees Granted

The degrees of Bachelor of Science, Bachelor of Science in Pharmacy, Bachelor of Science in Respiratory Therapy, Bachelor of Science in Toxicology, Associate in Science, and Associate in Science in Dental Hygiene are awarded to qualified candidates.

Accreditation

Each of the programs offered by the College is accredited by the appropriate professional group. The College holds memberships in both the American Association of Colleges of Pharmacy and the American Society of Allied Health Professions.

Health-Care Curriculum Open Option

If you are interested in pursuing a career in the health-care professions but are undecided as to which profession is right for you, then explore the Open Option offered by Northeastern's College of Pharmacy and Allied Health Professions.

A Valuable Foundation The Open Option program offers freshmen a core of courses designed to provide a basic scientific background required for each of the professional programs in the College of Pharmacy and Allied Health Professions. You also are introduced to the basic principles of health-care delivery, health-care agencies and services, and attitudes, behavioral aspects, and policies that may influence health-care systems.

The Advantages The Open Option is especially valuable to students who need assistance in determining an area of interest within the health-care field. By examining various professions, and thus gaining an overview of the discipline, you can refine your health-care career goals. You may also familiarize yourself with what is expected of you in various health-care professions. Subsequent selection of a professional program may proceed more smoothly, an advantage that may help you gain more confidence and certainty in pursuing your degree. Even though in the Open Option you consider various health professions, you still complete some prerequisite courses required of all the professional programs and so do not lose valuable time prior to selecting a major.

The Open Option Plan

In the Open Option Plan, you may complete the core courses in the first-year curriculum without selecting a profession in which to major and without loss of valuable time. Upon satisfactory completion of the first year of courses, you select a professional area in which to major. Professions in the college include pharmacy, health record administration, medical laboratory science, respiratory therapy, and toxicology.

The courses offered in the first-year Open Option include:

- Functions and Basic Calculus
- General Chemistry I and II
- General Biology
- Animal Biology
- Freshman Writing
- Introduction to Literature
- Professional Dynamics in the Health-Care Delivery System

Satisfactory completion of the eight courses in the Open Option core curriculum, as well as other courses completed during the freshman year is necessary for admission to one of the professional programs of the college.

The Open Option Plan does not apply to the Dental Hygiene and Physician Assistant programs.

Dental Hygiene

Professional Preparation

Aims The Forsyth School of Dental Hygienists conducts a program of dental hygiene education in cooperation with Northeastern University. Students in this two-year program attend classes at both the Forsyth Dental Center and Northeastern. The dental hygienist is licensed to render preventive services to a patient under the supervision of a dentist, including administering dental prophylactic treatment, preparing dental radiographs, and teaching prescribed methods of maintaining dental health.

A View of the Program The first year includes courses in anatomy and physiology, chemistry, microbiology, history, nutrition, dental materials, radiology, periodontology, dental hygiene, and clinical dental hygiene instruction. In the second year, students take general courses, such as English, sociology, and psychology, and professional courses in pathology, public health, pharmacology, dental hygiene, and head and neck anatomy; they also continue to receive clinical dental hygiene instruction.

Degrees Students satisfactorily completing the program will receive the Certificate in Dental Hygiene from Forsyth and may elect to receive the Associate in Science degree in Dental Hygiene from Northeastern University. Graduates are required to fulfill the Dental Hygiene licensure requirements in the state in which they intend to practice.

Accreditation

This program is accredited by the Commission on Dental Accreditation of the American Dental Association.

Admissions

Students are admitted directly to the Forsyth School for Dental Hygienists and should contact Forsyth for catalogs and applications by writing to 140 The Fenway, Boston, Massachusetts 02115.

Sample Freshman-Year Program of Studies in Dental Hygiene**First Quarter**

Human Anatomy and Physiology
 Chemistry
 Dental Anatomy
 Radiology
 Dental Hygiene
 Clinical Dental Hygiene

Third Quarter

Microbiology
 Dental Materials
 Periodontology II
 Nutrition
 Dental Hygiene
 Clinical Dental Hygiene

Second Quarter

Human Anatomy and Physiology
 Chemistry
 Histology
 Periodontology I
 Dental Hygiene
 Clinical Dental Hygiene

Basic Course Requirements**I. General Requirements**

Course	Q.H.	Course	Q.H.
English Composition and English Literature†	8	Foundations of Psychology I†	4
Chemistry*	8	Sociology†	4
Microbiology*	4	Human Anatomy and Physiology*	10

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Dental Anatomy*	2	Pathology†	3
Radiology*	2	Periodontology*	4
Dental Hygiene**	12	Public Health†	2
Clinical Dental Hygiene**	23	Pharmacology†	2
Nutrition*	2	Head and Neck Anatomy†	2
Histology*	2	Dental Materials*	2
		Independent Study†	2

*These courses are usually taken in the first year.

†These courses are usually taken in the second year.

**These courses are usually taken in both the first and second years.

Health Record Administration

Judith Weilerstein, M.P.H., *Associate Professor and Director*

Assistant Professor

Sheryl A. Rimer, M.P.H.

Professional Preparation

Aims A health record administrator may organize, operate, and manage medical record services. Northeastern's program offers students the opportunity to develop the capability to design health information and retrieval systems; to plan, organize, and direct medical record services; to develop, analyze, and evaluate medical records and indexes; to work with medical and administrative staffs in developing methods for evaluation of patient care; and to participate in research projects utilizing health-care information.

A View of the Five-Year Major In the first two years, the student will concentrate on liberal arts and sciences, including the required human anatomy and physiology courses with an overview of microbiology. Courses in health-care science are offered to help the student prepare for a role in health administration and health-care delivery.

The program offers the opportunity for preparation in administration, in departmental and hospital management and organization, and in electronic data processing. The professional courses in medical record science, medical terminology, and hospital law are complemented by directed applied study in medical record science at an affiliated health facility.

Degree The Health Record Administration program is offered on the cooperative plan. Successful completion of the prescribed curriculum, including directed study at an affiliated health center, will permit the award of a Bachelor of Science degree. Usually, graduates are eligible to take the registration examination given by the American Medical Record Association.

Accreditation

This program is approved by the Committee on Allied Health Education and Accreditation in cooperation with the American Medical Record Association.

Special Information

Students interested in this profession should arrange for an interview with the program director.

Sample Freshman-Year Program of Studies in Health Record Administration

First Quarter

English Composition
Biology
Math
Psychology
Orientation to Health Records I

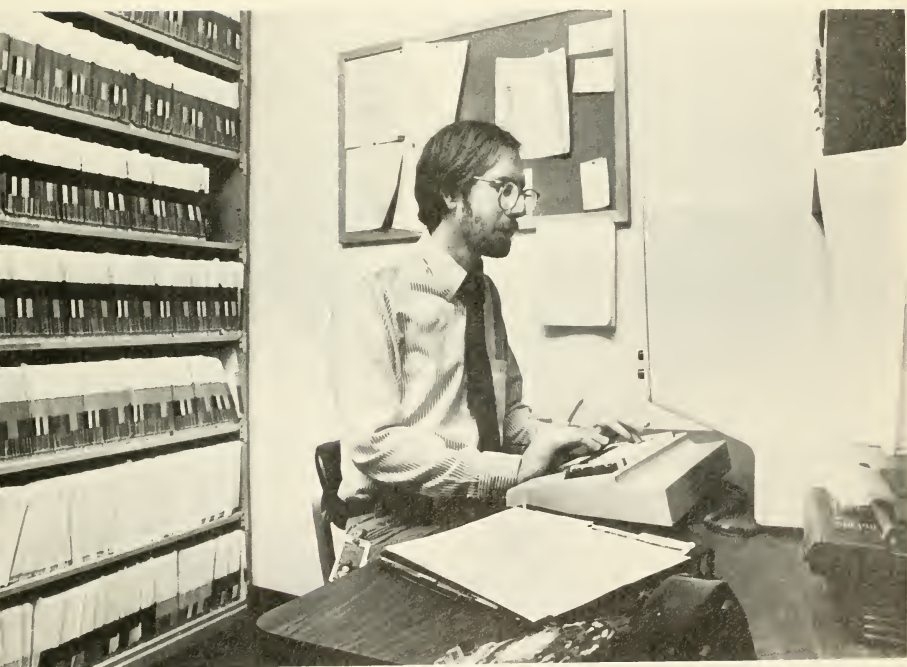
Third Quarter

Psychology
Modern Language or
Political Science
Microbiology
English Literature

Second Quarter

Biology
Math
Modern Language or
Political Science
Professional Dynamics in the
Health-Care Delivery System

In addition to the above courses, students may choose to take ROTC.



Basic Course Requirements**I. General Requirements**

Course	Q.H.	Course	Q.H.
English Composition and English Literature*	8	Organizational Behavior	4
Mathematics*	8	Introduction to Computer Science	4
Communications	4	Psychology*	8
Biology (General and Animal)*	8	Sociology†	4
Anatomy and Physiology†	10	Modern Language or Social Sciences*	8
Microbiology†	3	General Electives	16
Statistics	4		
Economics or Western Civilization	8		

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Orientation to Health Records	2	Seminar in Medical Records	2
Health Records Science I-IV	16	Health Science Education	2
Medical Terminology	4	Applied Study	9
Foundations of Medical Science	6	Hospital Organization and Management	4
Hospital Law	2	Application of Medical Computers	4
Organization and Management Medical Record Dept.	12	Quality Assurance	4
Applied Health Statistics	4	Independent Study	4
Clinical Seminar	2	Special Topics**	4
		Health Record Professional	2
		Professional Dynamics in the Health-Care Delivery System*	4

*These courses are usually taken in the freshman year.

†These courses are usually taken in the sophomore year.

**Assigned per Program Director.

Medical Laboratory Science Medical Technology

Gerald L. Davis, Ph.D., *Associate Professor and Director*

Professor

James J. Gozzo, Ph.D.

Associate Professors

Judith T. Barr, M.Ed.

Britta L. Karlsson, M.S.

Assistant Professors

Jaime R. Carlo, Ph.D.

Jessie L. Hansen, M.S.

John Klaas II, Ph.D.

Elizabeth G. Szymczak, M.S.

Professional Preparation

Aims Medical technology involves the application of principles of natural, physical, and biological sciences to the performance of laboratory determinations used in the diagnosis and treatment of disease and the maintenance of health. It is projected that the demand for properly educated and certified medical technologists will increase as a result of greater emphasis on the quantity and quality of health-care delivery. With educational opportunities available in hematology, immunohematology, clinical chemistry, and clinical microbiology, students have the opportunity to prepare themselves for positions not only in a hospital laboratory but also in research, industrial, and governmental institutions. Since 1976 opportunities for six months of co-op work experiences in foreign countries have been available to interested students. These have been an enriching experience for the participants.

For qualified graduates, additional opportunities may be found in laboratory administration, education, and graduate programs.

A View of the Five-Year Major Students enter the College as Health Professions majors in the Medical Laboratory Science program. The College offers a five-year modified cooperative course of study leading to the degree of Bachelor of Science. Upon satisfactory completion of the professional segment and baccalaureate degree, the student should be eligible to take a written national certification examination in medical technology. Some states may require additional licensure examinations.

During the junior and senior years, qualified students are assigned to the hospital components of the medical technology program. To qualify for entrance into the hospital component of the program, students must have an acceptable grade point average; have completed successfully all University course requirements, including those in biology, chemistry, mathematics, and medical laboratory science; and have met other criteria established by the Clinical Studies Admission Committee. The professional courses in hematology, pathogenic microbiology, serology, mycology, parasitology, clinical chemistry, instrumentation, and blood banking are included in both the University and the hospital components of the program.

Degree The degree granted will be the Bachelor of Science.

Accreditation

The Associate in Science and the Bachelor of Science degree programs are accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association.

Option

After completing the first two years of academic study and the basic professional courses, qualified students may take the appropriate practicum leading to eligibility to take a national certification examination for medical laboratory technicians and may earn the Associate's degree at the University.

Sample Freshman-Year Program in Medical Laboratory Science

First Quarter

Math or Calculus
General Chemistry
General Biology
English Composition
Orientation to Medical
Laboratory Science

Second Quarter

Math or Calculus
General Chemistry
Animal Biology
Professional Dynamics in
the Health-Care
Delivery System

Third Quarter

Elective

English Literature

Elective

Basic Medical

Laboratory Science

Analytical Chemistry

Basic Course Requirements**I. General Requirements**

Course	Q.H.	Course	Q.H.
English and English Literature*	8	Genetics and Developmental Biology	4
Biology—General and Animal*	8	Physics	10
Math or Calculus*	8	Microbiology	3
General Chemistry*	10	Humanities Electives	12
Organic Chemistry†	10	Social Science Electives	8
Analytical Chemistry*	4	General Electives	12
Physiology†	8	Professional Elective	4
Cell Biology	4		

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Orientation to Medical Laboratory Science*	1	Clinical Chemistry II, III, IV	6
Basic Medical Laboratory Science*	3	Clinical Microbiology II, III, IV	6
Basic M.L.S. Hematology I†	3	Applied Study (at hospital)	21
Basic M.L.S. Hematology II†	3	Laboratory Management	2
Basic M.L.S. Clinical Immunology†	3	Health Science Education	2
Basic M.L.S. Immunohematology†	3	Instrumentation I	1
Basic M.L.S. Chemistry and Instrumentation†	5	Parasitology	3
Basic M.L.S. Clinical Microbiology†	6	Mycology	3
Hematology III	3	Senior Seminar	2
Immunohematology II	2	Special Topics	2
Hematology IV	2	Professional Dynamics in the Health-Care Delivery System*	4
		Epidemiology	4

*These courses are usually taken in the freshman year.

†These courses are usually taken in the sophomore year.

Pharmacy

Richard C. Deth, Ph.D., *Associate Professor and Director*

Medicinal Chemistry Section

Robert N. Hanson, Ph.D.,
*Associate Professor and
Section Leader*

Professors

Roger W. Giese, Ph.D.
John L. Neumeyer, Ph.D.
Robert F. Raffauf, Ph.D.

Assistant Professor

Gerald S. Jones, Jr., Ph.D.

Pharmaceutics Section

Assistant Professors

Mehdi Boroujerdi, Ph.D.
Sara E. Rosenbaum, Ph.D.

Pharmacology Section

Professors

O. James Inashima, Ph.D.
Elliot Spector, Ph.D.

Associate Professor

Norman R. Boisse, Ph.D.

Pharmacy Practice Section

Larry N. Swanson, Pharm.D.,
*Associate Professor and
Section Leader*

Professors

Arnold S. Goldstein, L.L.M.
Gerald E. Schumacher,
Pharm.D.

Assistant Professors

Barbara Ameer, Pharm.D.
Barry A. Bleidt, Ph.D.
Robert J. Cersosimo, Pharm.D.
Donna L. Goolkasian, Pharm.D.
Samuel J. Matthews, Pharm.D.

Professional Preparation

Aims The need for well-qualified pharmacists is likely to continue in direct response to the greater emphasis on health care and, in particular, to the newer and more diversified utilization of those now in practice in this country. The majority of pharmacists are associated with community practice, and some of these are self-employed. Hospital pharmacy and institutional practice have attracted a large number of practitioners and represent the fastest-growing areas of the profession. The increased use of the pharmacist as a drug consultant to the medical and nursing staffs of these institutions has broadened the scope of professional opportunity and given practitioners even greater involvement as part of the health team.

Pharmacy also offers careers in research, manufacturing, government, law enforcement, and education. A considerable number of our graduates have entered leading graduate and professional schools. Another significant trend is found in the increasing number of women entering the profession. Approximately 40 percent of the entering class is now composed of women.

A View of the Five-Year Major The College offers a five-year curriculum that leads to the degree of Bachelor of Science in Pharmacy. The curriculum offers instruction in each of three natural divisions: (1) arts and sciences courses in general education (the humanities and social sciences); (2) mathematics and the basic physical and biological sciences; and (3) courses in the areas of professional instruction—medicinal chemistry, pharmacology, pharmaceutics, pharmacy administration, pharmacy practice, and clinical pharmacy.

The curriculum offers a well-balanced blend of academic classroom and cooperative education work experiences. Students completing the five-year baccalaureate pharmacy degree at Northeastern complete up to 3,000 hours of combined co-op and clinical clerkship experiences.

These experiences, we believe, enable our students to easily make the transition into pharmacy practice upon graduation. The classroom experience is well-structured and allows for the integration of the students' cooperative learning experiences. As is the case with other pharmacy programs across the country, the curriculum is five years in length, but with a much greater practical experience base. The pharmacy program maintains close affiliations with many of the leading hospitals in the surrounding Boston area.

In addition, through the Graduate School of Pharmacy and Allied Health Professions, programs leading to the Master of Science and Doctor of Philosophy degrees are offered. A graduate program in clinical pharmacy leading to the Doctor of Pharmacy (Pharm.D.) degree is also available for a limited number of qualified baccalaureate graduates.

Graduation Requirements

Degree Candidates for the Bachelor of Science in Pharmacy degree must complete all prescribed work of the curriculum and meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

No student transferring from another college or university is eligible to receive a degree until the last three years of academic work immediately preceding graduation have been completed at Northeastern. Exceptions to this requirement may be made for students transferring from another college of pharmacy.

Graduation with Honors

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University for at least six quarters before they become eligible for honors at graduation.

Accreditation

The undergraduate pharmacy program offered by the College of Pharmacy and Allied Health Professions subscribes to the standards established by the American Council on Pharmaceutical Education and the American Association of Colleges of Pharmacy, of which it is a member.

Licensure—Pharmacy

Pharmacists must meet certain requirements to obtain a license from the state in which they wish to practice. These requirements ordinarily include graduating from an accredited college of pharmacy, passing an examination given by a State Board of Pharmacy, and completing an "internship," or apprenticeship.

The internship is a period of supervised practical experience in a preceptor pharmacy. This is generally satisfied during the cooperative work periods commencing at the end of the student's second academic year. The salary earned during these periods of full-time employment may be used to help defray educational expenses. Students may apply up to 400 hours of the required academic clinical clerkship experience to their internship requirements. In addition, a college-directed externship adds to the total practice-oriented portion of the curriculum.

Sample Freshman-Year Program of Studies in Pharmacy

First Quarter

Basic Calculus*

General Chemistry

Arts and Sciences Electives

Second Quarter

Calculus

Professional Dynamics in the
Health-Care Delivery System

Biology

English

Third Quarter

Biology

English

General Chemistry

Arts and Sciences Elective

Students who are not adequately prepared may need to take other math courses.In addition to the above courses, students may choose to take Basic ROTC.***Basic Course Requirements****I. General Requirements**

Course	Q.H.	Course	Q.H.
Basic Calculus*	4	Anatomy-Physiology	10
Calculus*	4	Biochemistry	5
General Chemistry*	10	Arts and Sciences	
English*	8	Electives (7)	28
Biology*	8	Social Psychology†	4
Physics†	8		
Organic Chemistry†	10		

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Basic Pharmacy†	3	Professional Electives (2)	8
Pharmaceutics I & II, including Laboratory	11	Professional Practice Lab	1
Medicinal Chemistry/ Pharmacology I-III	16	Clinical Pharmacotherapy	5
Drug Analysis	5	Pharmacokinetic Principles in Drug Therapy	4
Drug Information & Evaluation	3	Caring for Patients: Psychosocial Aspects of Illness	4
Pathology	4	Pharmacy Management	4
Toxicology	4	Anti-Infectives	5
Biopharmaceutics/ Pharmacokinetics	4	Parapharmaceuticals	2
Pharmacology Lab I & II	2	Non-Prescription Medication	4
Jurisprudence	4	Interpersonal Skills for Health Professionals	4
Pharmacy Administration	4	Pharmacy Externship	4
Clinical Pharmacy Clerkship	15		
Professional Dynamics in the Health-Care Delivery System*	4		

These courses are usually taken in the freshman year.†These courses are usually taken in the sophomore year.*

Toxicology

David R. Brown, Sc.D., *Associate Professor and Director*

Associate Professor

Robert A. Schatz, Ph.D.

Professional Preparation

Aims Toxicology is the study of the injurious effects of substances on living organisms. It is often considered a subdivision of pharmacology, the study of chemical interactions between substances and biological systems. Toxicology can be considered as the science that defines the limits of safety of chemicals and other substances. Thus, one of the chief responsibilities of the toxicologist is prediction. By gathering sufficient data on the identification and toxicity of materials and adequate knowledge of the mechanisms by which effects are produced by materials, the toxicologist can make reasonable predictions of their hazard and impact in the biosphere.

The activities and contributions of toxicologists are many and varied. The profession's subdivisions of materials, radiation, and veterinary toxicology illustrate the diversity of investigations in which toxicologists may participate. The toxicologist working in the biomedical area is concerned with intoxications by drugs and other chemicals as well as the demonstration of drug safety or danger prior to release on the market.

Clinical toxicologists may be involved with:

1. antidotal treatment of poisoning
2. drug abuse, addiction, and detoxification
3. drug monitoring and drug interactions
4. teratogenesis (drug-induced birth defects) and other toxicity-screening procedures

Industrial or environmental toxicologists are concerned with the recognition, identification, and quantitation of relative hazard from occupational or public exposure to toxicants. This concern is closely related to private and government responsibilities to ensure the safety of workers and the general public in contact with industrial and commercial products.

Industrial or environmental toxicologists may be involved with:

1. chemical carcinogens
2. pesticides or other "economic poisons"
3. air, soil, and water pollution
4. food additives

Forensic toxicology is a hybrid of analytical chemistry and fundamental toxicological principles, and is concerned with the medicolegal aspects of the harmful effects of chemicals.

Forensic toxicologists may be concerned with:

1. the cause of death in postmortem investigations
2. isolation and detection of toxicants in biologic material
3. drug-abuse monitoring programs
4. medicolegal aspects of poisoning

The faculty of Northeastern University's College of Pharmacy and Allied Health Professions feels that increased concern over the safety of drugs, chemicals, and cosmetics in the human population and in the environment, as well as new legislation regarding toxic substances, cre-

ates a high demand for toxicologists at the Bachelor of Science level. One of the College's principal goals is to help train qualified professionals who will strive to meet the health-care needs of society. The concept of an undergraduate degree in toxicology is brought about by the demands of an increasingly complex chemical environment. Currently, few institutions offer B.S. degrees in toxicology, although more schools are planning such programs. Yet there is an estimated need for 5,000–10,000 people with bachelor's degrees to act as technical support staff for Ph.D.-level toxicologists.

Northeastern University has created an innovative program in which its diverse academic resources offer training to this new breed of toxicologist. The core curriculum is enhanced by contributions from the University's Institute of Chemical Analysis, Applications, and Forensic Sciences, the Northeastern University Marine Science Institute in Nahant, and the Environmental Engineering faculty.

Recent manpower studies sponsored by private and federal agencies predict a great demand for toxicologists. Although a need for toxicologists existed prior to 1970, the introduction of numerous federal and local laws aimed at protecting the environment, safeguarding employees in their workplace, and protecting consumers against hazardous household products has created a critical shortage of toxicologists. Employment opportunities are being created in industry (chemical, cosmetic, and pharmaceutical firms) and government (for example, Environmental Protection Agency, Food and Drug Administration, National Institute of Occupational Safety and Health) as well as in police departments and various clinical settings. Students may also consider entering graduate programs in toxicology.

A View of the Five-Year Major The Toxicology program leads to the Bachelor of Science degree in five years under the cooperative plan. The curriculum is a combination of liberal arts, science, and professional courses that offer students the opportunity to prepare themselves to practice toxicology in a variety of settings. Required and elective professional courses may be selected from Medical Laboratory Science, Chemistry, Biology, Sociology, Criminal Justice, Computer Programming, Mathematics, and Earth Sciences.

Toxicology students begin their cooperative experience in the sophomore year.

Degree The degree granted will be the Bachelor of Science in Toxicology.

Sample Freshman-Year Program of Studies in Toxicology

First Quarter	Elective
Mathematics	Professional Dynamics in the
Elective	Health-Care Delivery System
Biology	Third Quarter
English	Calculus
Second Quarter	English
Calculus	Arts and Sciences Elective
General Chemistry	General Chemistry
Biology	

In addition to the above courses, students may choose to take Basic ROTC.

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Math*	4	Anatomy-Physiology†	10
Calculus*	8	General Biochemistry	5
General Chemistry*	10	Clinical Biochemistry	4
English*	8	Microbiology	4
Biology*	8	Biostatistics and Computers†	4
Physics†	8	Identification of Organic Compounds	3
Organic Chemistry†	10	Instrumental Analysis	5
Environmental Problems†	4	Electives	44

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Drug Analysis	5	Drug Interactions	4
Medicinal Chemistry/ Pharmacology I-III	16	Public Health	4
Identification of Drug Abuse	4	Epidemiology	4
Pathology	4	Medical Laboratory Science	5
Toxicology I, II, III, IV	16	Professional Dynamics in the Health-Care Delivery System*	4
Pharmacology Laboratory I, II	2		
Toxicology Laboratory	2		

*These courses are usually taken in the freshman year.

†These courses are usually taken in the sophomore year.

Physician Assistant

Suzanne B. Greenberg, M.S., *Director*

Donald Wexler, M.D., *Medical Director*

Richard D. Nicklas, B.S., PA-C, *Clinical Coordinator*

Professional Preparation

Aims This is a program for the education of the primary-care physician assistant, a skilled person qualified by academic and clinical training to provide patient services under the supervision and responsibility of a doctor of medicine. The Physician Assistant may work in a variety of settings, such as a physician's office, clinic, hospital, or nursing home. It is expected that the Physician Assistant will be able to do at least the following: elicit a detailed and accurate history, perform a physical examination, perform routine procedures such as the drawing of blood samples, give injections, suture and care for wounds, counsel the patient on matters relating to health, and provide evaluation and treatment in life-threatening emergencies.

A View of the Major This twenty-two-month program, which begins in September, includes didactic work and clinical rotations in medicine, pediatrics, emergency medicine, psychiatry, obstetrics and gynecology, and primary care at teaching hospitals, clinics, health centers, and private physicians' offices. Students have the option of selecting up to one month of elective rotations in disciplines such as surgery, cardiology, dermatology, neurology, radiology, and the like. Clinical electives must be approved by the program and may vary in length from one to four weeks. Upon satisfactory completion of the program, students will be awarded a certificate by the University and are eligible to take the National Certifying Examination given by the National Commission on Certification of Physician Assistants. Some states require successful completion of this examination in order to practice.

Special Requirements Applicants to the program must have earned a bachelor's degree and have taken courses in chemistry and biology with laboratories at the college level. In addition, successful applicants must have had at least one year of direct, hands-on, patient-care experience.

Scholastic Aptitude Test scores are required for applicants. Application materials may be obtained by contacting the Physician Assistant Program Office at 202 Robinson Hall or by telephoning (617) 473-3195.

Accreditation

The Physician Assistant program meets the requirements established by the Council on Medical Education of the American Medical Association as essential for an approved educational program to provide students an opportunity for training as primary-care physician assistants. Membership in the Association of Physician Assistant Programs is maintained. The program is also approved by the Massachusetts Board of Approval and Certification of Physician Assistant Programs.

Other Information

Lecturers for the program include faculty from the medical schools at Harvard, Tufts, and Boston University.

Sample First-Year Program of Studies in the Physician Assistant Program

First Quarter

Human Anatomy
Essentials of Physical Diagnosis
Principles of Interviewing
Basic Medical Laboratory
Science
Pathophysiology and Medicine I
Roles, Rules, and Resources for
Physician Assistants
Medical Physiology

Principles of Pediatrics I
Principles of Psychiatry
Basic Diagnostic Radiology
Basic Pharmacology

Third Quarter

Pathophysiology and Medicine
III
Principles and Concepts of
Surgical Intervention in
Disease Processes
Principles and Concepts of
Emergency Medicine
Fundamentals of
Electrocardiography
Principles of Orthopedics
Introduction to Clinical Practice
Principles of Pediatrics II

Second Quarter

Principles of Obstetrics and
Gynecology
Pathophysiology and Medicine II
Physiologic Basis of Disease:
Neurology

Professional Requirements

Course	Q.H.	Course	Q.H.
Medical Care and Current Social Problems	2	Basic Medical Laboratory Science	3
Essentials of Physical Diagnosis	5	Basic Pharmacology	3
Principles of Interviewing	3	Medical Therapeutics	3
Principles of Psychiatry	3	Survey of Rehabilitation Medicine	2
Physiologic Basis of Disease: Neurology	2	Basic Diagnostic Radiology	2
Pathophysiology and Medicine I, II, & III	9	Principles of Obstetrics and Gynecology	3
Principles of Pediatrics	6	Fundamentals of Electrocardiography	2
Principles and Concepts of Surgical Intervention in Disease Processes	3	Roles, Rules, and Resources for Physician Assistants	2
Clinical Nutrition	3	Patient Education and Counseling	2
Medical Ethics	3	Principles and Concepts of Emergency Medicine	3
The Aging Process	3	Applied Study I, II, III, IV, V, & VI	24
Human Anatomy	2		
Medical Physiology	6		
Principles of Orthopedics	3		

Respiratory Therapy

Thomas A. Barnes, Ed.D., *Associate Professor and Director*

Associate Professor

Patrick F. Plunkett, M.S.

Instructor

Margaret A. Stewart, B.S.

Assistant Professor

Mary E. Watson, M.Ed.

Professional Preparation

Aims Respiratory therapy is an allied-health specialty, instrumental in the diagnosis, treatment, management, and preventive care of patients with cardiopulmonary problems. These patients may be found in newborn nurseries, surgical and medical wards, emergency rooms, outpatient departments, and intensive care units of hospitals. They may be suffering from a variety of acute and chronic conditions that are either life threatening or disabling.

Patients suffering a multiplicity of disorders from head injuries may require supportive mechanical ventilation. With the assistance of sophisticated ventilatory and monitoring equipment designed specifically for artificial ventilation, respiratory therapists become an essential part of the critical-care team. Through proper respiratory care and management, many patients who would not have survived are now being returned to an active life. In essence, the respiratory therapist is a life-support specialist.

In the hospital, "Code Blue, Code 99, Dr. Heart, Dr. Pacemaker" are all calls that may signify a life-and-death situation of cardiac and/or pulmonary arrest. The calls alert respiratory therapists to respond as members of an emergency cardiopulmonary arrest team, working alongside physicians and nurses. Respiratory therapists become responsible for life support of the patient through airway management, artificial ventilation, external cardiac massage, and many other sophisticated emergency support measures.

While intensive respiratory care is essential, routine patient care is equally important. Working under physician's orders, respiratory therapists carry out specific therapeutic measures to assist respiratory-distressed patients. Respiratory therapists must be experts in providing and recommending specialized and selective therapeutic respiratory care. They must be competent in such areas as medical gas administration, including oxygen; humidification, aerosols, and intermittent positive pressure breathing (IPPB); bronchopulmonary drainage and exercises; cardiopulmonary resuscitation, mechanical ventilation, airway management, and pulmonary function studies; blood gas analysis; and physiologic monitoring. Because respiratory therapy procedures may alter the patient's physiologic status, astute patient care and observation by trained respiratory therapists are essential.

Respiratory therapists are involved in the treatment of cardiac and pulmonary ailments such as cardiac failure, asthma, pulmonary edema, emphysema, cerebral thrombosis, drowning, hemorrhage, and shock.

Medications are delivered in such forms as aerosols or sprays through mechanical devices. These medications are then transmitted through the airways so that they may act on local areas within the lungs, as well as be diffused into the body's circulatory system.

Respiratory therapists make use of a variety of testing techniques to assist in medical research and diagnosis of disorders. One example is the use of radioactive gases or aerosols which are safely administered to the patient through the respiratory system. Various portions of the lung may be screened and evaluated for obstructions, restrictions, and other abnormalities. Another example is the securing of lung secretions for cancer diagnosis. The most common diagnostic examinations are the measurement of lung volumes and capacities, and flow patterns and pressures.

Today, the field of respiratory technology is expanding even more rapidly to keep pace with the demand for new techniques to cope with environmentally related problems such as smoking and air pollution. New techniques also have been developed for use in the treatment of gangrene, carbon monoxide poisoning, tetanus, and many other disorders.

A View of the Major Students enter the College as majors in the Respiratory Therapy program. Mathematics, chemistry, and the physical, biological, medical, and health sciences offer the bases for professional instruction in Respiratory Therapy. English, psychology, and elective courses in the humanities and social sciences offer a general educational background. Clinical study at the affiliated hospitals provides the opportunity for direct patient care and the immediate application of highly specialized techniques.

Degree The curriculum leads to the Bachelor of Science degree in Respiratory Therapy and includes academic quarters at the University, a structured clinical program, and assigned co-op quarters. Successful

completion of the first three years of the program makes students eligible for the first part of the examinations administered by the National Board for Respiratory Therapy.

Accreditation

This program is accredited by the American Medical Association.

Sample Freshman-Year Program of Studies in Respiratory Therapy

First Quarter

Freshman Writing
General Chemistry
Basic Animal Biology
Respiratory Therapy Seminar I
Mathematics

Third Quarter

Microbiology
General Chemistry
Respiratory Therapy Seminar III
Elective
Introduction to Literature

Second Quarter

Mathematics
Respiratory Therapy Seminar II
Basic Animal Biology
Physics
Professional Dynamics
in the Health-Care
Delivery System

Basic Course Requirements

I. General Requirements

Course	Q.H.	Course	Q.H.
Biology	8	Pharmacology	4
Anatomy and Physiology	10	English Composition and Literature	8
Microbiology	4	Arts and Sciences electives	16
General Chemistry	10	Arts and Sciences electives*	12
Organic Chemistry*	10		
Physics	4		
Mathematics	8		

II. Professional Requirements

Course	Q.H.	Course	Q.H.
Respiratory Therapy		Respiratory Care for the	
Seminars	3	Critical Patient	4
Clinical Seminars	2	Introduction to Pediatric	
Advanced Clinical		Respiratory Care	2
Seminars, I, II, III, IV*	4	Cardiopulmonary Lab	
Professional Practice		Technology	3
Labs I, II, III, IV	4	Cardiopulmonary Lab	
Cardiopulmonary		Practice	1
Physiology	4	Clinical Practice I	6
Advanced Clinical		Clinical Practice II	6
Physiology*	4	Advanced Life Support	
Cardiopulmonary Disease	4	Systems I, II*	8
Foundations of		Advanced Medical	
Medical Science	3	Monitoring*	4
Hospital Law and Ethics	2	Respiratory Care for the	
Medical Terminology	1	Neonatal Patient*	4
Introduction to		Practicum in Critical	
Patient Care	2	Care I, II*	8
Introduction to		Directed Study*	2
Respiratory Care	3	Professional Dynamics	
Respiratory Care for the		in the Health-Care	
Med-Surgical Patient	4	Delivery System	4

*Additional requirements for the Bachelor of Science degree in Respiratory Therapy.

Basic College Compensatory Programs for 1983–1984

The Basic College Compensatory Education Program continues generally to encompass five courses, each bearing four quarter hours of credit, which are to be offered in the sequences indicated below. Certain freshmen may be assigned to any one of these course sequences as applicable on the basis of testing administered during orientation week.

Fall

10.100 Mathematical Preliminaries I
30.101 Fundamentals of Writing I
51.146 Reading/Study Skills

Winter

10.110 Mathematical Preliminaries II
30.102 Fundamentals of Writing II

Specifically, 10.100 and 10.110 are to precede both the 10.104, 10.105, and 10.107 (nonbusiness math) sequence and the 10.118, 10.119, and 49.249 (business math) sequence; 30.101 and 30.102 collectively replace 30.113 (standard Freshman Writing) and are to precede 30.114 (standard Introduction to Literature) and, in the case of Lincoln College, the 30.114–30.206 (Literature of Engineering) sequence.

Schedule for Continuation of Compensatory Programming in the Basic Colleges for 1983-1984

These courses are approved/disapproved for credit, except where noted, by the faculties of the individual colleges and are, therefore, subject to change.

	30.101* Writing I	30.102 Writing II	10.100* Math Prelim. I	10.110* Math Prelim. II	51.146 Read. Study Skills
Arts and Sciences	accepted	accepted	accepted	accepted	accepted
Bouvé Physical Therapy	not accepted	not accepted	not accepted	not accepted	not accepted
Bouvé Physical Education	accepted	accepted	accepted	accepted	accepted
Bouvé Rec. and Leis. Stud.	accepted	accepted	not accepted	not accepted	not accepted
Bouvé Health Education	accepted	accepted	accepted	accepted	accepted
Bouvé Teacher Prep.	accepted	accepted	accepted	accepted	accepted
Business Administration	accepted	accepted	accepted	accepted	not accepted
Criminal Justice	accepted	accepted	accepted**	accepted**	accepted
Engineering†	not applicable	not applicable	not applicable	not applicable	not applicable
Lincoln College	accepted	accepted	not applicable	not applicable	not accepted
Nursing B.S.	accepted	accepted	not accepted	not accepted	not accepted
Pharmacy and Allied Health Professions	accepted*** w/o credit	accepted	not accepted	not accepted	not accepted
Computer Science†	accepted	accepted	not applicable	not applicable	not applicable

*Graded pass-fail and therefore not included in the student's quality-point average.

**Freshmen in the College of Criminal Justice are not required to take a mathematics course in the freshman year. However, if need for compensatory mathematics is substantiated by a diagnostic examination, students can elect to take 10.100 or 10.110 to prepare themselves for 10.104 Fundamentals of Mathematics as upperclassmen.

***Although the College of Pharmacy and Allied Health Professions does allow 30.101 to appear on the permanent record, it will only allow 30.102 for credit. Students completing the 30.101-30.102 sequence will have to make up the four-credit elective that was displaced by 30.101.

†Although the Colleges of Engineering and Computer Science do not allow 10.100 or 10.110 to be taken for academic credit, they do offer a special course sequence in college calculus with algebra and trigonometry (10.144 and 10.145) for engineering freshmen judged to have deficiencies in mathematics. The courses involve students in extra hours of work in algebra and trigonometry, but cover the same material as do the regular freshman calculus sequences in the Colleges of Engineering and Computer Science.

University College Alternative Freshman-Year Program

Program Goals

Northeastern University's highly successful Alternative Freshman-Year Program is designed for students who want to go to college but whose high school records do not reflect their true abilities. Because it is structured to assist students in making the academic and social adjustments necessary for success in college, this program may be the answer for those who feel that their potential is not reflected by their high school records and/or believe that they are not ready to undertake a full college curriculum.

The Alternative Freshman-Year Program is specifically designed to help students strengthen their basic academic skills in writing as well as mathematics. While helping them gain confidence in their ability to do college-level work, the program also offers them an opportunity to sample different areas of study before committing themselves to a specific major. Through the combination of a carefully prescribed curriculum and the attention of professional counselors, each student is helped to establish a program suited to his or her individual needs. These same counselors are normally available on a continuing basis throughout the student's entire freshman year.

Developed in collaboration with University College, a division of Northeastern serving students who seek a flexible college program, the Alternative Freshman-Year Program has a proven record of success in assisting students to develop their full potential. Many students who began their college careers in the program have attained sophomore status and have continued on to regular degree programs at the University.

Program Structure

Students in the Alternative Freshman-Year Program begin with 10–14 quarter hours of credit in their first academic quarter. In their second and third quarters, students accelerate their schedules of course work to take, respectively, 14 and 16–17 quarter hours of credit. Students in the health sciences track complete the Alternative Freshman-Year Program with a fourth quarter of 17 quarter hours of credit.

After completing the prescribed Alternative Freshman-Year Program, and achieving both a cumulative quality-point average of 1.400 or better and specific program requirements as noted, students may generally continue their degree programs within University College, or transfer, with sophomore status, to the College of Business Administration, the College of Criminal Justice, the College of Pharmacy and Allied Health Professions, the Boston-Bouvé College of Human Development Professions, or the College of Arts and Sciences. In addition to the cumulative quality-point average of 1.400 or better, the College of Business Administration requires a 1.800 average in five key courses, namely, 10.118, 30.400, 30.402, 39.601, and 49.499. Additional program requirements for students desiring to be admitted to sophomore status in the College of Pharmacy and Allied Health Professions are listed in the Student Handbook for Basic Colleges.

Faculty and Resources

The University has carefully selected for the Alternative Freshman-Year Program faculty members who are aware of individual student goals as well as the needs of students working to adjust to a college program. Faculty and students meet in small classes of not more than twenty-five students.

As members of the program, students are considered regular Northeastern University day students even though they have unique schedules and a distinctively tailored curriculum. Therefore, they generally have access to all counseling services, physical education facilities, dormitory arrangements, and extracurricular programs at the University's main campus in Boston.

Alternative Freshman-Year students are encouraged to make extensive use of the up-to-date programmed learning resources available for self-instruction through Northeastern's Learning Resources Center on the Boston campus. For additional assistance, Alternative Freshmen are also frequently referred to the University's Reading Clinic and/or the Math/Writing Center on the Boston campus. A third and very important resource, the Counseling and Testing Center, is also available to students on both the Boston and Burlington campuses for personal and academic counseling, as well as for vocational testing and counseling.

University College Alternative Freshman-Year Program

Business Track: One-Year Program

Quarter 1			Quarter 2		
No.	Course	Q.H.	No.	Course	Q.H.
10.100	Math I*	4	10.110	Math II*	4
30.400	Fund. of English I*	4	23.309	Hist. of Civ. A**	4
51.531	Integ. Language		30.402	Fund. of English II*	4
	Skills Dev. I*	2	51.532	Integ. Language	
				Skills Dev. II*	2
Total Quarter Hours		10	Total Quarter Hours		14
Quarter 3					
No.	Course	Q.H.			
10.118	Math. for Bus.	4			
23.310	Hist. of Civ. B	4			
39.601	Economics I	4			
49.499	Mgmt. & Org.	4			
Total Quarter Hours		16			

*Compensatory courses required may vary depending on placement tests.

**May be taken in Quarter I with permission of academic advisor.

**Criminal Justice, Education, or Arts and Sciences Track:
One-Year Program**

Quarter 1			Quarter 2		
No.	Course	Q.H.	No.	Course	Q.H.
10.100	Math I*	4	21.401	Sociology I	4
30.400	Fund. of English I*	4	23.309	Hist. of Civ. A**	4
51.531	Integ. Language Skills Dev. I*	2	30.402	Fund. of English II*	4
			51.532	Integ. Language Skills Dev. II*	2
Total Quarter Hours		10	Total Quarter Hours		14
Quarter 3					
No.	Course	Q.H.			
21.402	Sociology II	4			
22.401	Pol. Sci. I	4			
23.310	Hist. of Civ. B.	4			
30.114	Intro. to Lit.	4			
Total Quarter Hours		16			

*Compensatory courses required may vary depending on placement tests.

**May be taken in Quarter I with permission of academic advisor.

Health Sciences Track: One-Year Program

This option will be available for the first time beginning with the Summer Quarter, 1984.

Quarter 1		Quarter 2	
Course	Q.H.	Course	Q.H.
Pre-Chemistry*	5	Fund. of Mathematics	4
Fund. of English I*	4	Biology A	4
Integ. Language Skills Dev. I*	2	Fund. of English II*	4
		Integ. Language Skills Dev. II*	2
Total Quarter Hours	11	Total Quarter Hours	14
Quarter 3		Quarter 4	
Course	Q.H.	Course	Q.H.
Functions and Basic Calculus	4	General Chemistry	5
General Chemistry	5	Biology B	4
Directed Elective	4	Directed Elective	4
Directed Elective	4	Directed Elective	4
Total Quarter Hours	17	Total Quarter Hours	17

*Compensatory courses required may vary depending on placement tests.

Tuition and Fees

Tuition and fees for the Alternative Freshman-Year Program are the same as for students in the Basic Colleges (see page 240 for details). Payment of the standard tuition during the first three academic quarters of residence entitles students to forty-eight credit hours of instruction. Thus, those who take the forty programmed credits are entitled to an eight-quarter-hour tuition adjustment at the regular freshman rate.

Application Procedures

For further information on the Alternative Freshman-Year Program, or to request an application, please write or call:

Dean of Admissions

Department of Admissions

Northeastern University

360 Huntington Avenue

Boston, Massachusetts 02115

Telephone: 617-437-2200

Other Schools and Colleges of the University

Lincoln College

In addition to full-time curricula described earlier in this bulletin, Lincoln College offers interdisciplinary programs providing technological and professional development opportunities to meet special needs of the part-time student. These programs provide educational opportunities for students who must pursue full-time employment but who desire to initiate or continue their academic work.

The part-time evening program includes pretechnology preparatory courses and degree programs leading to the Associate in Engineering (A.E.), the Associate in Science (A.S.), and the Bachelor of Engineering Technology (B.E.T.). The A.E. degree may be earned in Computer Technology and Architectural, Environmental, Structural, Surveying and Highway, Electrical, and Mechanical Engineering Technology. The A.S. degree may be earned in Telecommunications and Energy Systems. Those students seeking further education may earn the B.E.T. degree in Computer Technology and Mechanical, Electrical, Mechanical-Structural, Aerospace Maintenance, and Civil Engineering Technology.

University College

Part-Time Evening Programs

University College is committed to the education of mature adult students who wish to live effectively in today's complex society. Programs are specifically designed to satisfy their changing professional, cultural, and social needs and interests.

Degree programs have been developed in several major fields of study in business administration, arts and sciences, law enforcement, and health professions. Flexible curricula are offered on a part-time basis Monday through Saturday during day and evening hours convenient to adult students. Students may select single courses or may enroll in degree programs leading to the Associate in Science or the Bachelor's degree. Classes are scheduled in locations accessible to the urban and suburban communities. Students may attend classes at the Huntington Avenue Campus in Boston or the Suburban Campuses in Burlington and Dedham, Massachusetts, as well as at thirteen other off-campus locations north, south, and west of Boston.

Academic advisers are available by appointment day and evening in the University College Office of Academic and Student Affairs. They offer students assistance in planning a program suitable to their general educational and career objectives and answer questions related to degree requirements, course sequence, and proper scheduling of courses. Appointments may be arranged by calling the University College Office, 617-437-2400, or by coming in person to 102 Churchill Hall. There is no charge for this service. Academic advisers are also available during registration at all registration sites. No appointment is necessary.

University College also offers a variety of career and other support services to its students, including career-development courses and counseling, job-search seminars, counseling and testing services, placement services, and special courses for women interested in business careers.

For a copy of the current University College *Bulletin*, please write or call: University College, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115, telephone 617-437-2400.

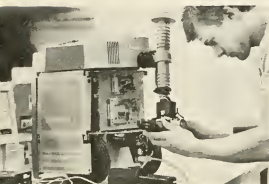
Full-Time Day Programs

In addition to offering a variety of part-time undergraduate programs, University College also offers two full-time day programs in allied health—the Radiologic Technology Program and the Dental Assistant Program. The admission procedures for these programs differ from those of other programs in University College. Therefore, individuals interested in these programs are advised to call or write for further information to the program offices listed below.

Radiologic Technology Program

Stanley A. Bozen, *Director*

Professional Preparation



Aims The radiologic technologist is an important member of any health-care team. Combining a technical background with extensive training and skills, the radiologic technologist is trained to use X rays to produce a clear picture or radiograph of a patient's tissue, bone, or organ structure for evaluation and interpretation by a physician. Northeastern University's Radiologic Technology Program is designed to offer students the opportunity to prepare for entry-level employment opportunities as radiologic technologists.

A View of the Program The Radiologic Technology Program at Northeastern offers a combination of academic preparation and clinical experience. Enrolling a new class of students in September of each year, the program consists of lecture and laboratory sessions held at Northeastern and periods of clinical training at selected radiology departments in Massachusetts hospitals. The program requires twenty-eight months of continuous study. A two-week orientation period is held prior to the beginning of classes each September.

Degree Upon satisfactory completion of the program, students are eligible to apply for the Associate in Science degree and to sit for the National Registry Examination for certification as radiologic technologists.

Certified graduates may, if they wish, seek career opportunities in the diagnostic and therapeutic environments of clinics and hospitals. However, they may also explore opportunities for employment in production, quality control, and facilities inspection at industrial firms. Certified graduates may also decide to consider a program in radiation therapy, nuclear medicine, or ultrasound technology, or may choose to continue their education by applying for acceptance to a bachelor's degree program in health science or hospital management.

Accreditation

This program is accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association and by the American Registry of Radiologic Technologists.

Application

For further information regarding the Radiologic Technology Program, or to request an application for admission, please contact:

Mr. Stanley Bozen, Director
Radiologic Technology Program
Northeastern University
244 Forsyth Building
360 Huntington Avenue
Boston, Massachusetts 02115
Telephone: 617-437-2818

Dental Assistant Program

Eleanor A. King, *Director*

Professional Preparation

Aims New knowledge, techniques, equipment and materials in the health sciences require an ever-increasing number of trained technicians and assistants to support the professional health practitioner. This is especially true in the field of dentistry, as many dentists find they can increase their effectiveness by employing a certified dental assistant to work with them.

Under the supervision of the dentist, dental assistants help provide direct patient care. Such work offers a number of rewards. The dental assistant has an opportunity to participate in a variety of interesting activities in a stimulating work environment and is often responsible for diverse tasks, including development of the interpersonal skills required in relating to patients and in caring for their special needs during office visits.

Employment opportunities for dental assistants are highly varied. Because dentistry is a multiservice profession, the dental assistant may decide to work in general dentistry or in a specialty such as oral surgery, a field requiring the assistant to work with a surgeon in a manner similar to that of a nurse in a hospital. Other individuals may prefer to work with an orthodontist, whose diagnostic treatment and laboratory procedures are directed toward the prevention and correction of irregularly aligned teeth and related facial structures. Further career opportunities may be available in the fields of pedodontics, i.e., dentistry for children; endodontics, which involves treating the inner structure of teeth; and periodontics, which is concerned with the tissues surrounding and supporting the teeth.

A View of the Program The Northeastern University Dental Assistant Program is offered in collaboration with the Tufts University School of Dental Medicine and other local clinical facilities. The program consists of thirty-seven weeks of full-time day instruction, with both lectures and laboratory sessions conducted at Northeastern University.

Credit The Dental Assistant Program includes the following noncredit professional courses: Dental Anatomy, Biology, Clinical Assisting, Radiology Theory and Practical, Nutrition, Dental Specialties, Medical Emergency, Dental Laboratory, Microbiology, Histopathology, Pharmacology, Prevention and Plaque Control, and Practice Management. Additional courses, which do carry college credit, are required in English and psychology.

Students who successfully complete the Dental Assistant Program and pass the certification examination may petition to receive up to twenty-four elective credits to be applied toward the Bachelor of Science degree program in Health Science offered by University College. Students who successfully complete the program and pass the certification examination may also petition to receive up to thirty-three credits in the Bachelor of Science Education degree program in the department of Community and School Health Education offered by the Boston-Bouvé College of Human Development Professions at Northeastern.

Accreditation

The Dental Assistant Program is accredited by the Council on Education of the American Dental Association. The program is designed to offer students the opportunity to prepare for the certification examination conducted by the Dental Assisting National Board, Inc.

Application

For further information regarding the Dental Assistant Program, or to request an application for admission, please contact:

Ms. Eleanor A. King, Director
Dental Assistant Program
Northeastern University
244 Forsyth Building
360 Huntington Avenue
Boston, Massachusetts 02115
Telephone: 617-437-2829

Graduate and Professional Schools

The following graduate and professional schools of the University offer day and evening degree programs.

Arts and Sciences

The Master of Arts degree may be earned in Economics, English, History, Political Science, Psychology, Sociology, and Social Anthropology. The Master of Science degree is available in Biology, Chemistry, Economic Policy and Planning, Mathematics, and Physics. The Master of Science in Health Science and the Master of Public Administration degrees are also offered. In addition, there is an Advanced Literary Study Program leading to the Certificate of Advanced Graduate Study, and programs leading to the Doctor of Philosophy degree in Biology, Chemistry, Economics, Mathematics, Physics, Psychology, and Sociology. Several degree options are offered in the interdisciplinary areas of law, policy, and society; clinical and forensic chemistry; sociology or social anthropology; and education. Most programs may be completed through either full- or part-time study.

Boston-Bouvé College of Human Development Professions

The Master of Science degree may be earned, with specialization in Physical Education, Physical Therapy, or Recreation and Leisure Studies. Graduate courses in Health Education are available as electives within the College and for special students. Programs may be completed through full- and part-time study.

The Master of Education degree may be earned with specialization in Community Mental Health Counseling, Curriculum and Instruction, Edu-

cational Administration, Educational Research, Human Development, Industrial Counseling, Rehabilitation and Special Education, School and College Counseling, or Speech-Language Pathology. The Certificate of Advanced Graduate Study is offered in Counselor Education, Educational Administration and Rehabilitation Counseling. The Doctor of Education degree may be earned in Administration and Supervision with specialization in Community Mental Health Leadership and Practice, Counselor Education, Educational Administration, or Rehabilitation.

Business Administration

A Master of Business Administration degree may be earned. The Graduate School of Business Administration offers a variety of programs to meet the needs and schedules of graduate business students. Two full-time program alternatives are offered: a twenty-one-month Management Intern Program, which includes a six-month, paid professional internship; or a two-year traditional full-time program, which may include administrative or teaching assistantship opportunities. Individuals who wish to continue their full-time job responsibilities while earning an M.B.A. degree may consider the evening part-time program of study, the eighteen-month Executive M.B.A. Program for upper-level managers, or the accelerated part-time High Technology M.B.A. for qualified technical specialists.

The Master of Science degree in professional accounting is an intensive, full-time program specifically designed for liberal arts and other nonaccounting majors.

In addition, there is a nondegree program for advanced study in business administration leading to the Certificate of Advanced Study in Business Administration.

The Center for Management Development offers several intensive, graduate-level programs within the College of Business Administration. They are designed to provide professional growth and to improve the overall performance of experienced managers. Based on a modification of the Northeastern cooperative format, these programs permit company-sponsored participants to maintain their job responsibilities during periods of classroom instruction. The Management Development Program spaces six weeks of in-residence instruction over four or five months depending upon the choice of session. Sessions begin in October, January, and March on the campus of Phillips Academy in Andover, Massachusetts.

The Center also sponsors The Management Workshops, scheduled one day each week for ten- or twelve-week periods at an off-campus facility. The three specialized workshops focus on the core functional areas, advanced management concepts, or management in high-technology organizations.

Criminal Justice

The College of Criminal Justice offers both full- and part-time programs leading to a Master of Science degree in Criminal Justice and, in cooperation with the College of Arts and Sciences, an interdisciplinary Master of Science degree in Forensic Chemistry. Students enrolled in the Master of Science program in Criminal Justice may choose from among five major concentrations of study: administration and planning; criminology; criminal justice counseling; research methodology; and security administration. The Master of Science program in Forensic Chemistry provides an integrated study of forensic chemistry as utilized in criminalistics laboratories and related professional fields. An interdisciplinary

Ph.D. program in Forensic Chemistry is offered through the College of Arts and Sciences in conjunction with the College of Criminal Justice with specialization in Forensic Materials Science or Forensic Analytical Chemistry. A further specialization in Forensic Toxicology is offered through the College of Pharmacy and Allied Health Professions, also in conjunction with the College of Criminal Justice. Students in either program attend classes during late afternoon and evening hours.

Engineering

The Master of Science degree may be earned, with specification in the field of Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Engineering Management, Information Systems, or Mechanical Engineering. A six-year program in Power Systems Engineering leading to both bachelor's and master's degrees in Electrical Engineering is offered and a special five-year honors program in Mechanical, Industrial, or Electrical Engineering leading to both bachelor's and master's degrees; the Professional Engineer degree in Mechanical, Industrial, or Electrical Engineering; the Doctor of Engineering degree in Chemical Engineering; and the Ph.D. degree in Chemical, Civil, Electrical, or Mechanical Engineering. A special interdisciplinary program leading to the Master of Science in Transportation is also offered.

Law

The School of Law offers a full-time program of professional instruction, leading to the degree of Juris Doctor (J.D.). It is fully accredited by the American Bar Association and the Association of American Law Schools. There are no courses for part-time or evening students.

Unique among American law schools, Northeastern's School of Law features cooperative legal education. Under this plan, each student is required to work full time at law for participating employers for four calendar quarters during his or her second and third years, alternating with equal periods of full-time course work. This blending of academic study and practical legal work experience, after a traditional first year of intensive academic study, is designed to offer the best possible preparation for the actual practice of law. Cooperating employers include large and small private firms, government agencies, legal assistance and public defender organizations, judges, unions, corporate law departments and virtually every type of legal practitioner. Employers are located nationwide.

Because the school operates twelve months a year, students complete the program on the same schedule as more traditional schools.

Pharmacy and Allied Health Professions

The Master of Science degree is offered in Biomedical Science, Clinical Chemistry, Hospital Pharmacy, Medical Laboratory Science, Medicinal Chemistry, Pharmacology, and Radiopharmaceutical Science. The Ph.D. degree is offered in Biomedical Science with specialization in Medical Laboratory Science, Medicinal Chemistry, Pharmaceutical Science, Pharmacology, or Toxicology. An interdisciplinary doctoral degree is available in Forensic Chemistry, and the Doctor of Pharmacy (Pharm.D.) is offered in the graduate program in Clinical Pharmacy.

Professional Accounting


The Master of Science degree in Professional Accounting is offered as a concentrated 15-month program, designed for arts and sciences and other nonaccounting majors who anticipate careers in professional ac-

counting and who wish to prepare for the CPA examination. The five-quarter course includes a three-month internship with a leading CPA firm in the middle or winter quarter, thus providing both practical experience and financial support.

New classes start in mid-June of every year.

Some of these programs are offered on the cooperative plan; others provide teaching and research fellowships for able candidates.

The Center for Management Development



Sponsored by the College of Business Administration, the Center for Management Development offers programs designed to provide opportunities for professional growth for middle and senior managers. Two programs are scheduled several times a year: the Management Development Program (MDP) and The Management Workshop. In both, participants are sponsored by their employers. The Center also designs and conducts special programs for a wide range of business organizations. The MDP is a graduate-level course in business for managers who already have had responsibility for a major task, function, department, division, or independent enterprise. Six weeks of in-residence instruction are extended over a period of several months (October to February, January to May, or March to June).

The Management Workshop offers a comprehensive outline of the major areas of business through three different programs of graduate-level content. The Management Workshop I, The Management Workshop II, and The Management Workshop—High Tech are each held one day per week (Fridays or Mondays) for either ten or twelve consecutive weeks during the September to June period. The Center can be reached by telephone at 617-437-3272.

The Center for Continuing Education

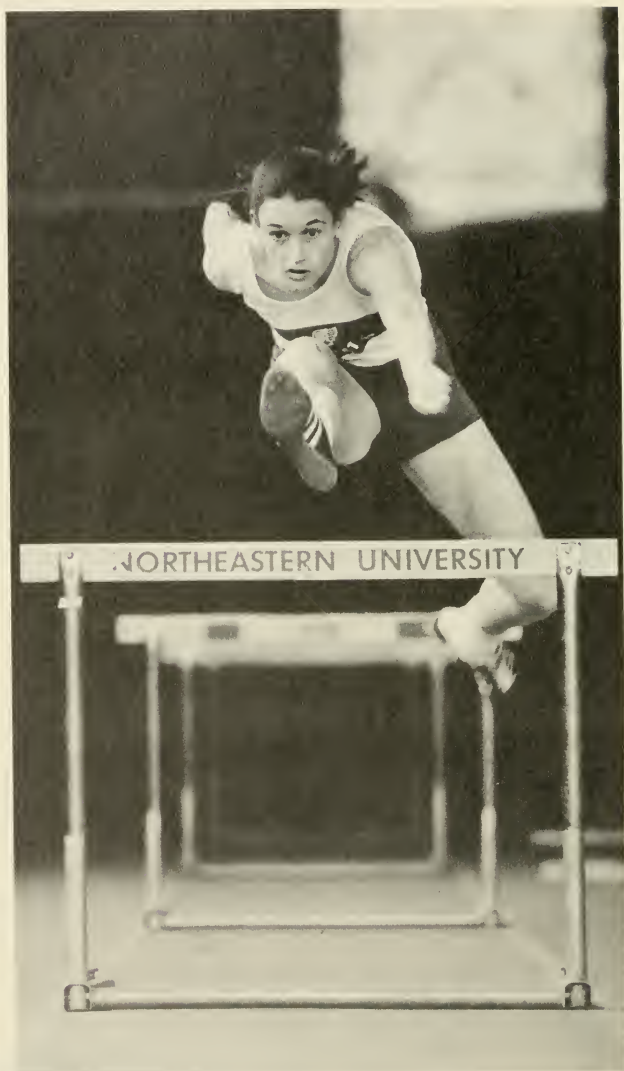
The Center for Continuing Education serves the community in a variety of ways. Programs range from public offerings of enrichment courses to state-of-the-art seminars in engineering concentrations; from short-term, first-line training sessions in supervisory skills to concentrated three-week sessions for corporate executives; from workshops in nursing and other health professions to comprehensive programs in graphic arts management and food preparation; from special concentration seminars developed for a particular client company to the nationally known Urban Mass Transportation Management Seminars conducted by Northeastern University in conjunction with the United States Department of Transportation. Telephone: 617-329-8000.

Insurance Institute

The Insurance Institute is sponsored by local insurance organizations and companies. It offers a number of noncredit courses in preparation for the Chartered Life Underwriter and Chartered Property-Casualty Underwriter designations, as well as for the General Insurance, Insurance Adjuster, and Risk Management Certificates. Telephone: 617-329-8000.

Part Three

Particulars of Education



Undergraduate Admissions

139 Richards Hall

Tel: 617-437-2200

Philip R. McCabe, M.Ed., *Dean*

Mary A. Zammitti, M.Ed., *Associate Dean and Director*

Assistant Directors

Steven B. Bissell, B.S.

Michael F. Clifford, B.S.

Eleanor W. Lambert, M.B.A.

Admissions Counselors

Viola F. Covington, B.A.

Robert D. Hunter, B.S.

Cornelius B. O'Leary, B.A.

George L. Williams, B.S.

To find a college or university that will suit personal needs and interests—a place where you can learn to feel at home and make sound preparation for a future career—is a goal of all students who plan to continue their education beyond secondary school. The goal can be achieved in a number of ways: by talking with enrolled students, faculty, and alumni; by reading catalogs; and by visiting college campuses. In fact, a college campus visit should be high on your list of priorities. Northeastern's Committee on Admissions extends a cordial welcome to all prospective freshman and transfer students and has planned a series of on-campus experiences to make a visit as worthwhile as possible.

The Admissions Conference

It is only natural that students should have many questions about Northeastern—its programs of study, its services to students, and the Cooperative Plan of Education. For this reason, the Committee on Admissions sponsors a series of Orientation Conferences for students. Offered at 10:00 a.m. and 2:00 p.m. on Mondays and Fridays from October 1 through May 1 (except for legal holidays), these conferences have been most successful in helping students become better acquainted with the University. They include comments by an admissions counselor, an informal question-and-answer period, and a multimedia presentation.

Special sessions are also held in the summer between July 1 and September 1. Further information about these summer conferences may be obtained from the Admissions Department.

Guided Tours

Student-guided tours of the campus are usually held daily, Monday through Friday, at 11:00 a.m. and 3:00 p.m. The admissions conference and the tour should both be scheduled in advance by writing or calling the undergraduate Admissions Office (617-437-2211). The opportunity to visit the University's facilities and to observe student life on campus is one important way to learn about Northeastern. Commuting students who wish to visit the University's Suburban Campus in Burlington are encouraged to do so. This will appeal especially to those whose home communities are located north or northwest of Boston.

The Interview

Although it is not required, a personal interview is generally regarded as an appropriate opportunity for students with special questions to meet with an admissions counselor. In studying the secondary school record, the counselor may discover some factor that merits further explanation. In this event, the applicant may be asked to arrange a visit to the Admis-

sions Office. The interview, therefore, may be held at the request of the student or the counselor. In most cases, contacts with Admissions personnel will be more beneficial if the *Northeastern University Bulletin* has been carefully studied before the personal interview.

Special Note

Northeastern does not hold Saturday classes for students in the Basic Colleges; hence, guided tours cannot be provided at that time. A week-day visit to the University is recommended. However, special Saturday appointments may be arranged on a limited basis.

General Requirements for Entrance

An applicant for admission to Northeastern University has, ideally, completed a challenging secondary school program—a program that includes courses in English, foreign language, mathematics, laboratory science, and history. Proficiency in a foreign language is especially important for students entering the College of Arts and Sciences. But the overall school record has importance in itself, both as an indication of achievement in subjects critical to university study and as a reflection of a wise choice of electives. Candidates are encouraged to broaden their reading outside of class. The student who can communicate ideas, understand the meaning of words, and write effectively is at a distinct advantage. Most important, the high school transcript should provide clear evidence of sound study habits so vital to success in higher education.

Today's high school students have had the advantage of many innovations that have greatly enriched their experience—independent study, small group seminars, research projects, and off-campus experiences related to community service or future vocations. Northeastern is understandably interested in the growth of the work/study concept in many secondary schools, and the Committee on Admissions looks with favor upon the variety of these worthwhile experiences.

Preparation for Study in Engineering, Computer Science, Science and Mathematics, and Allied Health Professions

It is only natural that evidence of special aptitude and the highest possible level of preparation in the sciences and mathematics should be required for entrance to certain programs of study offered by the University. Such programs include:

College of Arts and Sciences*

Biology, Chemistry, Geology,
Mathematics, Physics

Boston-Bouvé College of Human Development Professions*

Physical Education
Physical Therapy
School and Community
Health Education
Speech and Hearing
The Teaching of Secondary
Science/Mathematics

College of Computer Science

Bachelor of Science program

College of Engineering

All programs

Lincoln College

Bachelor of Engineering
Technology degree program

College of Nursing

Bachelor of Science program

College of Pharmacy and Allied Health Professions

All programs

*See page 35 for additional majors offered by these Colleges.

Courses in science and mathematics vary greatly in terminology, teaching methods, and content. Applicants are encouraged, however, to complete the full sequence of such courses if possible. In science, this would usually include a full academic year of study and laboratory work in biology, chemistry, and physics; and, in mathematics, geometry, algebra 1 and 2, and a fourth year of trigonometry and/or analysis. Experience has shown that students in programs emphasizing mathematics and science need courses in the social sciences and humanities to be fully prepared for professional courses.

Preparation for Study in Business Administration

Candidates for admission must have successfully completed a strong preparatory program in high school, including courses in geometry, algebra 1, and algebra 2. While mathematics plays an important role in the total program, strong emphasis is also placed on liberal studies to effect an intellectual balance with liberal and appreciative courses.

Preparation for Study in the Social Sciences, Teaching, and Criminal Justice

Many candidates for admission have enjoyed their greatest success in areas other than mathematics-science. Their interests lie, quite naturally, in the study of the humanities and social sciences. Thus, such a student may choose to apply for admission to one of the following programs:

College of Arts and Sciences* In addition to the science programs, the College offers programs in Arts and Humanities with majors in Art, Drama, English, Journalism, Modern Languages, Music Literature, Philosophy, and Speech Communication, and in Social Sciences with majors in African-American Studies, Economics, History, Human Services, Linguistics, Political Science, including a concentration in Public Administration, Psychology, and Sociology/Anthropology.

Boston-Bouvé College of Human Development Professions*

Professional courses leading to the opportunity for *teacher certification* are based upon a strong foundation of liberal arts study in the humanities and social sciences. Elementary Education majors may focus on one of four areas: humanities, reading-language, social sciences, and special education. There is also a major in Early Childhood Education. Secondary Education majors may choose between English and social studies.

The College also offers majors in Human Services and in Recreation and Leisure Studies with emphases in a variety of areas including Recreation Management, Outdoor Recreation/Environmental Education, and Therapeutic Recreation.

College of Criminal Justice By its very nature, the program in Criminal Justice requires a strong base of liberal arts study before professional courses are introduced. Applicants for admission should therefore demonstrate an ability to succeed in their study of the behavioral, social, and human services.

Entrance Examinations (Freshmen)

Research clearly indicates that the best single predictor of college academic success is achievement in secondary school. Thus, this factor, together with the recommendations of the school counselor, weighs most heavily in the evaluation process. Although the Scholastic Aptitude Test and three Achievement Tests of the College Board are required, the Committee on Admissions does recognize that these test results do not measure such qualities as determination, imagination, and leadership.

English composition has to be one of the three required Achievement Tests. Students can choose the other two tests in subjects in which they feel most confident. Students whose native tongue is not English may substitute the Test of English as a Foreign Language (TOEFL) for the English Composition Test. No single schedule of testing is recommended, but applicants are advised not to take subject matter tests unless they are currently studying such subjects.

For full information about College Board Examinations, consult a school guidance counselor or write directly to:

The College Board
P.O. Box 592
Princeton, New Jersey 08540
or
P.O. Box 1025
Berkeley, California 94701

The American College Testing Program may be substituted for the College Board Testing Program. For full information, write to:

American College Testing Program
P.O. Box 168
Iowa City, Iowa 52243

Admissions counselors also will be glad to answer questions about these testing programs.

Advanced Placement

The University grants advanced placement credit to those students with a score of 3 or better in their Advanced Placement Examinations. Students may take the examinations in the following subjects: American history, art (history of art, studio art), biology, chemistry, classics (Virgil, lyric), computer science, English (composition, literature), European history, French (language, literature), German language, mathematics (calculus AB, calculus BC), music, physics (physics B, physics C—mechanics, physics C—electricity and magnetism), and Spanish (language, literature).

Applicants are required to take the Advanced Placement Tests of the College Board in May.

College-Level Examination Program

The University cooperates with the College Board in its CLEP Program. CLEP provides a national program of five General Examinations and forty-seven Subject Examinations to evaluate nontraditional college-level education. Qualified students are encouraged to take the general and/or subject matter examinations of CLEP, so that college credit may be allowed upon entrance. In general, the Committee on Admissions ac-

cepts the score range recommendations of the College Board. Northeastern University has been designated a CLEP Testing Center. Inquiries may be addressed to Counseling and Testing Center, Room 302, Ell Student Center.

Carl S. Ell Scholars Program

The University is very interested in providing recognition to students for their high academic achievement and, for this reason, has recently introduced the Carl S. Ell Presidential Scholar award, named in honor of the University's second president.

Twenty-five freshman-year tuition scholarships are given to students selected for this academic achievement award.

Applying for Admission and Plans of Admission

Entry Dates

Northeastern University admits qualified freshman students to all programs in September. The University also has a January entrance date for most of its programs. Entrance dates for transfer students vary by program; many admit students at the beginning of each of the four quarters.

The application should be filled out properly, signed, and forwarded to the Dean of Admissions, Northeastern University, Boston, Massachusetts 02115 together with a nonrefundable \$25.00 application fee. Checks should be made payable to Northeastern University. This fee may be waived in cases of extreme hardship as endorsed by the candidate's secondary school counselor or social worker. It is to the students' advantage to submit applications for admission promptly. Students are also responsible for making sure that their transcripts and College Board scores are submitted to the University.

Program Selection

Many students have difficulty in selecting a program of studies. For this reason, the University has introduced flexibility into its programs so that students may explore alternative fields or tailor their programs to personal goals. Freshman candidates have to indicate a choice of college and, in some cases, a major. In the College of Arts and Sciences, Business Administration, Computer Science, Criminal Justice, Engineering, Lincoln College, and Pharmacy and Allied Health Professions, students do not have to make a definite choice of major concentration or emphasis until the end of the freshman year and in some programs until the end of the sophomore year. There is also flexibility in choosing a major in the teacher preparation program offered by Boston-Bouvé College of Human Development Professions. In certain programs, a limited number of electives are available for freshman students.

Rolling Admission Plan

Under Northeastern's Rolling Admission Plan, candidates may be notified of their acceptance at a point in their secondary school careers when there is sufficient evidence that they will be able to profit from study at the university level. This may occur early in the senior year or after the results of College Board Examinations have been evaluated. In all cases of acceptance, candidates are to complete successfully the senior year of high school.

Students should note that enrollments are limited in some programs where the number of applications is expected to exceed campus resources.

Deferred Admissions Plan

Accepted students who wish to participate in the Deferred Admissions Plan will be asked to describe the activities they plan for the year preceding enrollment. Students may choose this plan for a variety of reasons that may include travel, health problems, or work. Information on the plan is available from the Admissions Department.

Early Admission—Juniors, Second-Semester Seniors

In certain cases, students may enroll at Northeastern prior to high school graduation. Such students may enroll at Northeastern either in September or January, thereby reducing the time to complete degree requirements by one year. A special form provided by the Admissions Committee requires the endorsement of the school principal or guidance counselor for early admission. Write to the Department of Admissions for further details.

College of Arts and Sciences

Students accepted for entrance to the College of Arts and Sciences should refer to page 39 for the description of the four tracks students are placed in by the College before beginning their freshman studies.

Alternative Freshman-Year Program

The Alternative Freshman-Year (AFY) Program was developed in collaboration with University College, a division of Northeastern serving students who seek a flexible course schedule. The program may be ideal for those students who feel that their high school grades do not reflect their true abilities and/or believe that they are not ready to undertake a full college curriculum.

The AFY Program is specifically structured to assist students in making the academic and social adjustments necessary for success in college. Working with a counselor, students follow a prescribed curriculum designed to meet their individual needs and to help them sharpen basic academic skills in writing and mathematics while gaining confidence in their ability to do college-level work. In addition, the program also permits students to sample different areas of study before committing themselves to a specific major.

The full range of counseling services, physical education facilities, dormitory arrangements, and extracurricular programs is generally available to students enrolled in this program.

For further information about the Alternative Freshman-Year Program, see page 217.

Programs for Minority Group Students

Northeastern University deliberately seeks to expand educational opportunities for deserving, minority-group students and to recruit promising students from economically and culturally disadvantaged backgrounds. In so doing, it has increased its guidance and other supporting services in order that such students may be assured the opportunity to succeed in their chosen fields of study. Supporting services include tutorial study and programmed instruction. These and other counseling services are provided by the University's African-American Institute.

Project Ujima Program

"Ujima" is Swahili for "collective work and responsibility." The purpose of Northeastern's Project Ujima is to assist disadvantaged minority-group students in developing their potential to the fullest extent.

The program is designed to help make students aware of their potential and to urge them forward with a sense of direction and purpose. Special programs such as minicourses, counseling seminars, tutorials, and training sessions are provided to meet the needs of these students.

Open Campus Courses

Under Northeastern University's Open Campus Plan, qualified high school students who can gain release from their schools are invited to take full-credit courses at Northeastern while they are still enrolled in secondary school. In this way, students are able to gain a better idea of the collegiate environment while they work toward college credit. For further information, write to the Admissions Department.

Cooperative Freshman-Year Program

College of Engineering Summer Quarter Each June, the College of Engineering enrolls a limited number of qualified students in all programs under a special summer Cooperative Freshman-Year Program.

Students may enter Northeastern University in the June following completion of the senior or junior secondary-school year and complete the first quarter of their college freshman year from June to September.

Graduating high school seniors then continue their freshman academic programs or undertake cooperative work assignments. The first cooperative work assignment normally occurs either in the winter quarter (January to March) or in the spring quarter (April to June). Under special circumstances, and at the discretion of the faculty coordinator, freshmen may be placed in September, following completion of their first academic quarter. After this work assignment, the student will return to Northeastern and complete the freshman year. The exact schedule will be based upon the professional judgment of the Cooperative Education Department and the academic progress of the student.

By extending the freshman year, enrollees have the opportunity to defray a portion of their first-year expenses.

Following the summer term, juniors have the option of returning to their secondary schools with credits earned toward college degrees or staying on at Northeastern, with the permission of their secondary schools, as members of the freshman class. Students who choose to remain at Northeastern then have the opportunity to participate in cooperative work assignments similar to those held by graduating seniors, either in the fall or winter quarter. For additional information, write to the Admissions Department.

Orientation and Registration

The orientation and registration program, which begins with your arrival in September, officially launches your academic career at Northeastern.

The administration, faculty, and many upper-division students have planned several days of programs, faculty seminars, meetings, and special events designed to help you adapt to college life in general and Northeastern University in particular.

In addition to participating in regular registration operations, receiving class schedules, and purchasing books, you will meet with the dean and faculty members of your college, who will provide information concerning your planned academic major, courses, and career goals.

You will have the opportunity to attend "how to study" seminars, peer-counseling sessions, and many other informative events. The Department of Cooperative Education, for example, has planned meetings regarding job opportunities and school-work experiences.

You will be introduced to members of more than 130 student organizations, some of which you might choose to join. Guided tours of Boston's historical and cultural centers will also be available.

Freshman students are assigned to classes based on their choices of college and major, high school records, and a variety of placement tests taken during the orientation and registration program.

Skill and Competency Development

Responding to what is apparently a growing national need to improve basic writing, numerical, and reading/study skills among otherwise academically acceptable college freshmen, the University extends to freshman in several of its participating Colleges the opportunity to enhance the likelihood of academic success as freshmen through enrollment in compensatory (i.e., development) courses.

Selection for such course work is based upon the correlation of competency data derived from specifically prepared testing procedures administered during Orientation Week with pre-freshman academic credentials.

The freshman writing sequence, the mathematics sequence, and the reading/study skills course each year bear full credit in participating colleges. (See page 216.)

Instructors, freshman advisers, and the Freshman Affairs Staff of the Dean of Students' Office are ready to assist involved freshmen in achieving success in their endeavors.

Special Students

A limited number of special students may be admitted to the Basic Colleges. Special students are not degree candidates and must meet criteria set by the college to which they are admitted.

Those admitted as special students usually have completed some college-level work. The following are among the applicants who may be considered:

- a college or university graduate who needs additional course work to prepare or qualify for a graduate program;
- individuals, recommended by deans or program directors, who need particular formal course work to meet professional requirements for certification;

- students who need several courses to complete degree requirements at another college or university, provided they have written approval from the appropriate college dean; others who are recommended by deans of the colleges to take courses leading to regular admission. In such cases, special-student enrollment should be limited to one academic quarter.

All special students will be charged a nonrefundable application fee of \$25. Before obtaining and paying for an application, the potential special student should consult a counselor in the office of the dean of the college offering the course(s) desired. Tuition will be at the quarter-hour rate in effect at the time and must be paid before registration is valid. Special students will be admitted to classes only when there is space available.

All special students must obtain approval from the office of the dean of the Basic College in which they wish to enroll prior to each quarter's registration, but will be required to pay the application fee only once.

International Students

International students are required to complete and file the regular undergraduate application at least six months before registration. They must meet all admission requirements, including the standardized tests administered by the College Board. All academic credentials should be translated into English before being forwarded to the Department of Admissions. After notification of acceptance, students must pay the required deposits and fully complete the University's Declaration and Certification of Finances Form by the date specified on the acceptance certificate before an I-20 Form can be forwarded.

All international students participate in the University's five-year cooperative education program. Only students in the College of Arts and Sciences may petition to complete their degree program in four years.

Northeastern University is authorized under Federal law to enroll non-immigrant alien students.

Students may obtain a copy of the *International Student Admissions Booklet* by writing to the Department of Admissions.

English Language Center

Before being considered for admission, international students whose native language is not English are required to demonstrate some English language proficiency. This can be done by obtaining a score of 450 or better on the College Board's Test of English as a Foreign Language (TOEFL) or by successfully completing an approved English language course of study.

After acceptance, international students whose native language is not English will be required to complete the placement test administered by the University's English Language Center. The results of this test will be used to assign students to their English courses. Students with minimal English language skills will be assigned to the noncredit Intensive English Course. The level of course work required in English will determine the student's academic schedule.

Admission of Transfer Students

Students wishing to transfer into the Basic Colleges of Northeastern University may request advanced standing as upperclassmen on the basis of acceptable credits in an accredited two- or four-year institution or a technical institute.

Basic Requirements

Full details of the University's transfer policy are available in the *Transfer Booklet*. This publication will be mailed to you upon request. The basic requirements follow:

1. Only candidates who present satisfactory college records, appropriate to the course of study they wish to pursue, may be considered for advanced-standing credit.
2. Credit is generally given toward a Northeastern degree for any course reasonably equivalent to a course offered by Northeastern and completed with a passing grade at another institution.
3. Candidates must be in good standing and eligible to continue in the institutions they are currently attending.
4. Evidence of honorable dismissal is required.

Application Procedure

If September entrance is planned, complete an application for admission no later than July 1. In certain programs, enrollment is possible at the beginning of each Northeastern quarter of study. Complete information on entrance dates for transfer students with advanced standing is available with the application. All transfer students are required to indicate their choice of major on the application.

Submit a high school transcript. Request that an official transcript from each college attended be sent, including a list of the courses that will be completed prior to the end of the academic year.

NOTE: Transfer students are not required to complete entrance examinations.

Orientation and Registration

All transfer students are required to participate in an orientation and registration program scheduled immediately before the beginning of classes. This one- to five-day program provides transfer students with the opportunity to meet with their faculty advisers and plan their course schedules. They will also meet with members of the Student Affairs Office and the Cooperative Education Department.

Required Deposits from Freshmen and Transfer Students

If the Committee on Admissions makes a favorable decision on a student's application, the student will be asked to submit a nonrefundable tuition deposit of \$100 by May 1. This deposit serves as an indication of intent to enroll and is applied to the first-quarter tuition account. A nonrefundable dormitory deposit of \$100 is due at the same time for the student who will reside in University housing. An additional nonrefundable room-assignment deposit of \$400 is also required before definite room arrangements are made.

Students applying for entrance dates other than September should read carefully their certificates of acceptance, which will indicate the required deposit dates.

General and Special Health Requirements

All Students

Prior to registration at Northeastern the Lane Health Center's Pre-en-trance Physical Form is sent to each student upon acceptance. It is mandatory that each applicant return this completed form, which includes the medical history. This examination *requires* a tuberculin test within six months of the registration date. A rubella titre test is also *required* for all students enrolling in any and all health majors. It is also *required* for all students who expect to have hospital affiliations. This test is recommended for all female students. All students whose academic program requires hospital affiliation are required by the hospitals to have proof of having had measles or immunization against measles when they were more than one year of age. Similarly, proof of immunizations against German measles is required unless a satisfactory antibody titre against German measles is demonstrated. This information must be forwarded to the University physician for review. Proper health clearance is considered a condition of admission.

Except in the most extreme instances, neither physical nor emotional problems are considered a bar to admission. In fact, we actively encourage handicapped students to become part of the University community. With pertinent information, we usually can make the adjustments to college life smoother and supply special aids when needed.

Sound health and physical fitness are especially important for students in Boston-Bouvé College of Human Development Professions and the College of Nursing and are required by their nonuniversity affiliations. Candidates for admission to the College of Nursing are required to receive special health clearance prior to enrollment. A repeat health examination by the Lane Health Center is given in the third year for physical therapy and physical education students in the Boston-Bouvé College of Human Development Professions and before the third and fifth years for students in the College of Nursing.

Medical Laboratory Science students in the College of Pharmacy and Allied Health Professions are required to have recent physical examinations before entering clinical applied studies in the third or fourth year.

College Expenses

Students are advised that tuition rates, room-and-board charges, and fees are subject to revision by the Board of Trustees at any time. They should also note that the freshman year consists of three quarters of full-time study. The Cooperative Plan, whereby students may be gainfully employed, does not begin until the sophomore year.

The primary purpose of the Cooperative Plan is to provide invaluable on-the-job training, but it also can help make education possible without the accumulation of a large personal debt. Because of the Plan—and the University's determination to keep basic expenses as low as possible—many deserving students who might not otherwise be able to afford an education have attended Northeastern.

Expenses for the Freshman Year (Three Quarters)

Tuition for the freshman year, for those who enroll in September, is payable in three installments at the beginning of the fall, winter, and spring quarters. For those who enroll in January, payments are due at the beginning of the winter, spring, and summer quarters.

Board-and-room expenses for those living in University-sponsored residence facilities vary slightly according to the dormitory to which a student may be assigned. These costs are computed on the basis of a seven-day-a-week arrangement and are also paid in three installments at the beginning of each quarter.

Total Freshman Expenses

Application Fee	\$ 25.00
Tuition (Engineering, Lincoln College, Business Administration, Computer Science)	5,745.00
Tuition (All other colleges)	5,325.00
Board and Room (if applicable)*	3,930.00†
Student Center Fee	37.50†
Infirmary Fee (if applicable)	75.00†
Health Services Fee	220.00
Laboratory Deposit (if applicable; \$10.00 charge for extra cards)	30.00

The above list excludes personal expenses and expenses for books and supplies.

**This scale is for Speare and Stetson Halls. See Housing section, page 275.*

†Payable in three installments at the beginning of each freshman quarter: September 26, 1983; January 2, 1984; and April 2, 1984. For students who enroll in January, the dates would be January 2, 1983; April 2, 1984; and June 29, 1984.

Special Note

Nonrefundable deposits of \$100 for tuition and \$100 for board and room are payable not later than May 1. An additional nonrefundable deposit of \$400 will be required from those who request housing. These deposits are applied to the first-quarter costs. The board-and-room deposits reserve a space in a University dormitory.

Expenses for Upperclassmen

	Tuition for Arts and Sciences, Boston-Bouvé, Criminal Justice, Nursing, Pharmacy and Allied Health	Tuition for Engineering, Lincoln College, Computer Science and Business Administration
<i>Division A</i>		
September 26, 1983	\$2,479.00	\$2,654.00
April 2, 1984	2,479.00	2,654.00
<i>Division B</i>		
January 2, 1984	2,479.00	2,654.00
June 24, 1984	2,479.00	2,654.00
<i>Division C*</i>		
September 26, 1983	2,479.00	2,654.00
January 2, 1984	2,479.00	2,654.00
April 2, 1984	2,479.00	2,654.00

**Division C is the term used to denote the classification of students who are temporarily or permanently on a noncooperative academic year. Certain students in the College of Arts and Sciences may select a noncooperative four-year program. In other colleges, this program is temporary, sometimes required of transfer students to phase into the Cooperative Plan.*



Required Fees for All Students

Application Fee

A fee of \$25 is required when the application for admission is filed. This fee is nonrefundable.

Ccident and Sickness Insurance

The University provides an excellent hospital insurance and student health program. All students will pay a nonrefundable University Health Service fee of \$245 per year. This fee will cover the group Blue Cross-Blue Shield program and the medical services provided to students by the University Health Service.

Student Center Fee

All students in the Basic Colleges on the Huntington Avenue campus are charged a fee of \$12.50 per quarter for the services available in the Student Center building.

Graduation Fee

The University requires a \$35 graduation fee from all candidates for a degree. This fee must be paid before the end of the fifth week of the last scholastic quarter in the senior year. Candidates in the College of Nursing are also required to pay a charge of about \$10 for their graduation pins.

College of Nursing Uniforms

Students in the baccalaureate degree program of the College of Nursing purchase uniforms in the fall quarter of the sophomore year.

College of Pharmacy and Allied Health Professions Uniforms

Students in Respiratory Therapy purchase uniforms in the spring quarter of the sophomore year.

Students in Dental Hygiene purchase uniforms in the fall quarter of the freshman year.

Students in Radiologic Technology purchase uniforms in the fall quarter of the freshman year.

Students in the Medical Laboratory Science programs purchase laboratory coats in the spring quarter of the freshman year. Co-op assignments to hospitals usually will require uniform purchases in the spring or summer quarter of the sophomore year.

Student Activities Fee

A fee of \$6.00 per quarter for all upperclass students to fund student clubs, activities, etc. The \$6.00 fee is currently reflected in the freshman tuition.

Other Fees

International Student Fee

There is a one-time fee of \$200 charged to new, undergraduate international students, payable upon their acceptance at Northeastern.

Liability Insurance

Freshmen majoring in the Colleges of Nursing (Bachelor Degree Program and Special Program for R.N.s) and Allied Health (Respiratory Therapy), as well as all upperclass students in Nursing, Pharmacy and Allied Health Professions (excluding Health Records), and medical or

health-related programs in Boston-Bouvé College of Human Development Professions, are required to carry liability insurance. A fee of \$18 is charged per year.

Payment of Tuition

All payments should be made at the Cashier's Office, 248 Richards Hall, or by mail. Checks should be made payable to Northeastern University. Beginning with the second week of any quarter, students are not eligible to attend classes unless their tuition has been paid, or specific arrangements have been made with the Bursar for a plan of deferred payment.

It is the student's responsibility to ensure that all tuition and dormitory charges and fees are paid when due. If a bill has not been received prior to the start of classes each quarter, it is necessary that the student come in person to the Bursar's Office where a bill will be processed.

Any discrepancies in billing should be immediately brought to the attention of the Bursar's Office. If there is a billing problem, the undisputed portion of the bill should be paid on time to avoid any additional late fees. Failure to receive a bill through the mail or to pay the undisputed portion of the bill are not justification for late payment of amounts actually owed.

Deferred Payment

Deferred payment of tuition entails a fee of \$10, which is levied on all accounts not paid by the end of the second week of classes. To arrange for a deferred payment plan, students must contact the Bursar's Office before the start of the second week of classes.

Late Payment Fee

A fee of \$100 will be assessed for failure to arrange for, and make, payments in accordance with the prescribed regulations.

Laboratory Deposits

Students taking laboratory courses should be prepared to purchase laboratory deposit cards from the Bursar as directed by the department offering the course. These deposits will be charged with deductions for breakage and destruction of apparatus in the laboratory. A charge of \$5 each is made for extra cards.

Reserve Officers' Training Corps—Uniform Deposit

Freshmen enrolling in ROTC make a deposit of \$35 to cover loss of, or damage to, ROTC uniforms and equipment. Any loss or damage exceeding the deposit will be charged to the student.

General

Students in the College of Nursing may expect to be assessed fees for clinical laboratory experiences. Physical Education majors pay a room-and-board charge for a resident program at the Warren Center in the spring quarter. Recreation and Leisure Studies students pay a fee for a one-week term of camping at the Warren Center. A one-week session in winter sports is optional for Recreation and Leisure Studies majors in their junior or senior year (at a cost of \$175).

Refunds

The University provides all instruction on an academic-quarter basis, for which students pay at the beginning of each quarter. Tuition refunds in all schools and colleges may be granted through the first four weeks of a quarter only when specific conditions are met and on the basis of the date appearing on the official withdrawal application. (Nonattendance does not constitute official withdrawal.) Questions regarding refunds should be discussed with the Dean of Students' Office. When approved, refunds are made as follows:

Tuition Refund

Official Withdrawal Filed Within	Percentage of Tuition Refunded
1st week of Quarter	100
2nd week of Quarter	75
3rd week of Quarter	50
4th week of Quarter	25

Room and Board

(New Freshman and Transfer Students)

Rental charges for rooms in University accommodations are refundable only in cases of withdrawal prior to the start of a quarter (except in special circumstances so adjudged by the University). The \$100 and \$400 deposits are not refundable. Board charges may be refunded for all unused portions when the food identification card is surrendered to the Office of the Dean of Students for Housing.

Overloads

Tuition covers the cost of each student's required courses for a quarter. In addition, a course worth one quarter hour of credit may be taken without added charge. However, any other additional courses will be billed as overloads to the students taking them.

Financial Aid

Charles M. Devlin, M.Ed., *Dean of Student Financial Services*

Financial assistance in the form of loans, grants, and work-study is available on an annual basis to qualified students. Undergraduate financial aid funds are administered in accordance with a nationally established policy and philosophy of financial aid for students pursuing a degree in higher education. It is a basic premise of this policy that parents have an obligation to pay for the education of their children to the extent that they are able to do so. In addition, students are expected to contribute to their educational cost from summer and co-op earnings, outside agency awards, their own assets, and other resources they may have. Financial aid is available only for meeting the difference between the total family contribution (parents' and student's contribution) and the annual educational costs. The parents' contribution is determined by an objective analysis of the family's financial state: net income, number of dependents, allowable expenses, indebtedness, and assets. Criteria established by the College Scholarship Service are used in making the evaluation.

The University does not award any form of financial assistance to students who are not citizens or permanent residents of the United States.

Application Procedure

Initial Year (Freshman and Transfer Students) Applicants seeking financial assistance for their freshman year are required to complete their applications by February 15 for summer or fall entrance and by October 15 for winter or spring entrance. Transfer students must complete their applications by April 15 for summer or fall entrance and by October 15 for winter or spring entrance. (Transfer applicants must also have completed Financial Aid Transcripts on file from all previously attended post-secondary schools by the deadline dates.)

On the FAF you must indicate Northeastern University (code 3667), the Pell Grant Program, and your state scholarship program (if applicable) as recipients of the FAF. The FAF is available from secondary school guidance offices or the Financial Aid Office.

Awards are made on a first-applied, first-aided basis and are contingent on continued funding. The typical award takes the form of a package combining a grant, a loan, and/or part-time employment. Awards may be adjusted at any time upon receipt of other funds or changes in status.

All initial year recipients of financial aid are required to submit a copy of their parents' prior year tax return before their financial aid award is final.

Application Procedure

Upperclass (Sophomore-Senior) Upperclass applicants are required to submit a Financial Aid Form to the College Scholarship Service and a Northeastern University "Upperclass Application for Financial Assistance" each year for which they desire assistance. On the FAF you must indicate Northeastern University (code 3667), the Pell Grant Program, and your state scholarship program (if applicable) as recipients of the FAF. Financial aid awards are made for the entire academic year and must be filed prior to the following deadlines:

In school Fall and Spring Quarters
In school Winter and Summer Quarters

April 15
August 15

Application Procedure

Graduate and Law Students All Graduate and Law School applicants must file the Graduate and Professional School Financial Aid Services (GAPSFAS) form, a Northeastern University "Application for Financial Assistance," and a Financial Aid Transcript from each post-secondary school attended. Parents' financial information is required on the GAPSFAS form from *all* applicants. Application deadlines are as follows:

Law students
All other graduate students

February 15
April 15

Eligibility and Selection

In order to be eligible to participate in the financial aid program at Northeastern University, all students must a) apply for financial aid, completing the proper application forms and submitting them in a timely fashion; b) ascertain financial need; c) be in attendance at Northeastern University, pursuing a first academic degree on at least a half-time basis in an eligible program; d) be making normal academic progress as

determined by the college in which the student is enrolled; e) meet any other eligibility requirements of the individual aid programs.

Due to limited funding, Northeastern University is not always able to meet the full financial need of all applicants. Priorities in awarding aid will be based on highest financial need, meeting application deadlines, and potential for academic achievement. All financial aid is contingent on the availability of funds.

Most students who attend Northeastern University move along with their class. On request, information about retention and attrition can be obtained from the Office of the Dean of Students.

Mail Inquiries to:

Northeastern University
Office of Financial Aid
P.O. Box 75
Boston, Massachusetts 02117

Office Hours

8:30 a.m. to 4:30 p.m., Monday–Friday

Telephone Numbers

General Information	617-437-3190
Pell Grant Information	617-437-3804
Help/GSL/Parent Loans	617-437-3386
Initial-year Information	617-437-3907
Student Employment Center	617-437-3200

State Scholarship Programs

The Office of Financial Aid strongly advises applicants for aid to apply to state scholarship programs at the same time that they apply for aid from the University.

The Commonwealth of Massachusetts provides scholarship aid to Massachusetts students pursuing full-time programs of study in an accredited college or university. Awards are made in the summer of each year, and applications for entering freshmen are available through their high school guidance offices. Out-of-state students should investigate aid programs in their respective states. Substantial state aid is offered by Connecticut, New Jersey, Pennsylvania, Rhode Island, Vermont, and Maine.

Federal Programs

Note: All Federal financial aid programs are subject to change, depending upon adequate and continuing Federal support.

Pell Grant (formerly Basic Educational Opportunity Grant)

This is a program of direct federal grants to undergraduate students only. Eligible students can receive as much as \$1,800 per year toward the cost of their education. Pell Grants are generally available to all students who have not previously received a bachelor's degree, who are not in this country on a student visa, and who are attending college on at least a half-time basis (minimum 6 quarter hours). To utilize this program to the fullest, all students applying for financial aid *must* file for a Pell Grant.

Applications for a Pell Grant can be made on the Financial Aid Form (FAF), which is available from local high schools, or by calling the Pell Grant unit of the Financial Aid Office at 617-437-3804

College Work-Study Program

This is a need-based program of part-time employment under the sponsorship of the federal government. It is designed to help full-time students meet their educational expenses. Students generally work part time while attending classes. Eligible students may work for the University or for public or private nonprofit off-campus agencies. The Office of Financial Aid has the responsibility of placing qualified students in their job assignments.

Supplementary Educational Opportunity Grant

Supplementary Grants are direct awards provided by the federal government. They are available to a limited number of full-time undergraduate students who present evidence of needing financial assistance. Eligible students who are accepted for entrance may receive Supplementary Educational Opportunity Grants ranging from \$200 to \$2,000 for each year of their undergraduate education.

Health Professions Loan

This program is available to full-time undergraduate students who have been accepted for a course of study leading to a Bachelor of Science degree in Pharmacy. A student who evidences financial need and academic promise may borrow as much as \$2,500 per academic year. Repayment of principal and interest does not begin until one year after the student ceases to pursue a full-time course of study. Repayment of principal may be extended over a ten-year period with interest at the rate of 9 percent per annum.

Guaranteed Student Loan Program

Under this program, students who are enrolled for at least one-half the normal academic work load may borrow from a participating bank or other financial institution. Terms and conditions vary from state to state, but the law allows dependent undergraduates to borrow a maximum of \$2,500 per year, up to a total of \$12,500, for undergraduate study. Independent undergraduates may borrow up to \$3,000 per year, with a total limit of \$15,000. The federal government pays the interest while the student is in school. The student must begin repaying the principal of the loan plus interest shortly after the student drops below half-time enrollment.

Applications for the loan itself are available from local banks or the Education Office of your state government. Additional information and necessary application forms for first-time borrowers are available from the Financial Aid Office.

Parent Loans for Undergraduate Students

Under the Parent Loan Program (PLUS), parents of dependent undergraduate students may borrow up to \$3,000 per year for each child enrolled in an approved educational institution. These loans are also offered by banks and other financial institutions, although terms and availability vary from state to state. Unlike the Guaranteed Student Loans, the PLUS loans require parents to begin repayment of the loan (with 12 percent interest) within 60 days of receiving the loan. Repayment may be stretched out over ten years, as long as the minimum monthly payment of \$30 is maintained. Applications and more information can be obtained from local lending institutions.

National Direct Student Loan

Direct Loans are available to students who present evidence of needing financial assistance. Undergraduate students may borrow up to a maximum of \$3,000 for the first two years, or a total of \$6,000 for their entire undergraduate education. Students are allowed a total maximum of \$12,000 through their undergraduate and graduate education. Repayment and interest on Direct Loans are not required until 6 months after a student graduates or withdraws from the institution.

Repayment of principal may be extended over a ten-year period, with the interest rate at 5 percent per annum. Repayment may be deferred up to three years if the student is pursuing at least a half-time course of study or serving in the Peace Corps, VISTA, or the armed forces.

Nursing Student Loan

This program is designed for full-time undergraduate students who have been accepted for a course of study leading to an Associate or Bachelor of Science degree in Nursing. Provided financial need is evident, students may borrow as much as \$2,500 each year up to a maximum amount of \$10,000 for their entire undergraduate education. Repayment and interest on these loans do not begin until nine months after the student ceases to pursue a full-time course of study. The repayment of the principal may be extended over a ten-year period with the interest at the rate of 6 percent per annum.

Reserve Officers' Training Corps Scholarship Program

(Refer to section on Reserve Officers' Training Corps.)

University Scholarships

The following scholarships are awarded through the Office of Financial Aid. Because we award specific scholarships to the students who qualify, you should not apply for any specific scholarship. If you feel you are a potential recipient for any of these listed awards, you may bring that fact to our attention.

The Vivian B. Allen Scholarships

Nursing

The Vivian B. Allen Foundation Endowment for nursing scholarships was established in 1968 through the generosity of the Vivian B. Allen Foundation, Inc. The income from a \$500,000 endowment fund is to be used to provide scholarship assistance for students entering or enrolled in the College of Nursing of Northeastern University. The application procedures and qualifications for selection are the same as those for all other scholarships.

Alumni Scholarships

All Colleges

Scholarship aid is available to entering freshmen who are relatives of alumni. Applications must show evidence of scholastic achievement and financial need.

Class of 1967 Alumni Scholarship

Day College Students

The Northeastern University Class of 1967 Alumni Scholarship was established in 1967 and endowed in 1982 by the Class of 1967. Income from the fund is to be awarded each year based on financial need, campus activities, and scholastic achievement. Priority will be given to children, other relatives, and friends of the Class of 1967.

Irving Aronson Scholarship

Engineering

The Irving Aronson Scholarship for Electrical Engineering students was established through the generosity of the family of Irving Aronson as a living memorial to a man who shared his life with many people and who cared so much for the educational process. Income from this fund will be awarded or loaned to electrical engineering students who demonstrate financial need and academic responsibility.

George L. Barnes Scholarship

All Colleges

This fund was established in 1969 by Miriam P. Poole, daughter of George L. Barnes, in memory of her father, a distinguished member of the Northeastern University Corporation and Board of Trustees from 1937 until his death in 1965.

The income from this fund will annually provide a full scholarship to a deserving student from Weymouth, Massachusetts. The award is made on the basis of need and character. Some additional assistance may be given in the upperclass years.

The Barry Scholarship

Engineering

The Barry Scholarship, established in 1973 by the Barry Division of Barry Wright Corporation, is available to students in the College of Engineering. Preference will be given to mechanical engineering majors and sons and daughters of Barry employees, based upon demonstrable financial need and academic achievement.

The Mr. and Mrs. Emil**Matthew Bauer Fund**

All Colleges

The interest from the Fund, established in 1954, is used for scholarships or other financial assistance to students of German birth or of German extraction studying at Northeastern University. The scholarships are available to either men or women students enrolled in any year at the University.

The Alvah K. Borman**Memorial Scholarship**

Gamma Phi Kappa

Fraternity Undergraduates

This scholarship was established in 1976 through the generous contributions of Gamma Phi Kappa Fraternity alumni. In 1979, the Gamma Phi Kappa Fraternity Alumni Association, Incorporated, voted to name the scholarship in memory of Alvah K. Borman, Northeastern University's Dean of Graduate Placement. Dean Borman was an active member of the GPK fraternity for over forty-six years, serving as an undergraduate brother (class of 1936), faculty advisor from 1953 to 1965, an active alumnus until his untimely death in 1979.

Awards from this fund are made annually to undergraduate members of the Gamma Phi Kappa Fraternity who have demonstrated good academic standing. Recipients of this award must have been members in good standing of the Gamma Phi Kappa Fraternity for at least six months prior to the time of award.

**Boston Housing
Authority Scholarships**

All Colleges

As an expression of Northeastern's commitment to the city of Boston, the University has established 100 full-time undergraduate scholarships for residents of housing developments run by the Boston Housing Authority (BHA). Applicants for the scholarships, which will be offered for the first time in September 1984, must meet the requirements for admission to Northeastern and be residents of BHA housing.

Martin Brown Scholarship Fund

Engineering

This scholarship was established in 1961 by Mr. Martin Brown, an engineering alumnus of the Class of 1921. Its purpose is to assist qualified students enrolled in the College of Engineering who have need and have demonstrated above-average scholastic ability.

Wellington Burnham Fund

All Colleges

This fund provides financial assistance to worthy students of limited means without discrimination as to race, creed, color, or scholastic attainment. It was established in 1961 under the provisions of the will of George A. Burnham.

**The Godfrey L. Cabot
Scholarship Fund**

All Colleges

This fund was established by Dr. Cabot in 1954 to help meet the college expenses of employees or children of employees of Godfrey L. Cabot, Inc., and its subsidiary and associated companies. To be eligible, the employee must have completed at least five years of service with the company prior to the time the student enters the University. The University shall determine the number and amount of these scholarships, which are not limited to outstanding students and which are available to evening as well as day students. Students interested in applying for scholarship aid from this fund should communicate with the Cabot Personnel Office or the Office of Financial Aid at Northeastern University.

**Camp Dresser & McKee, Inc.
Scholarship**

All Colleges

This Scholarship was established in 1973 by Camp Dresser & McKee, Inc., and is available to students in all colleges. Preference for awards will be based upon demonstrable financial need and academic achievement.

**Louis S. Cashman Memorial
Scholarship Fund**

Business Administration

This fund was established by the Massachusetts Credit Union Association (CUNA) and friends of Mr. Cashman in recognition of his outstanding service to the credit union movement in the Commonwealth of Massachusetts.

This scholarship is awarded annually to students in the College of Business Administration who have need, with particular preference given to those enrolled in Banking and Finance.

The Gardner A. Caverly Scholarship

All Colleges

This scholarship was established in 1957 through the generosity of Mr. Gardner A. Caverly, an alumnus of the College of Business Administration and a member of the Class of 1934. Its purpose is to provide financial assistance and encourage qualified students from the New England area to attend Northeastern University. In selecting worthy students for these scholarship awards, preference is given to graduates of the Rutland, Vermont, and Laconia, New Hampshire, high schools.

**Carl W. Christiansen
Scholarship**

Business Administration

The Carl W. Christiansen Scholarship Fund was established in 1976 by Mr. Carl W. Christiansen, a graduate of the School of Commerce and Finance, Providence Division of Northeastern University, Class of 1923. Early in his career, Mr. Christiansen was an accounting instructor and associate dean in the Providence Division. In 1927, the accounting firm of Christiansen, Murphy and Company was founded, which in 1940 became known as Christiansen and Company—Certified Public Accountants. The income from this fund is to be awarded annually to an entering freshman in the day College of Business Administration who has demonstrated the necessity for financial aid. Preference will be given to students from the state of Rhode Island who are interested in pursuing a career in accounting.

Ruby H. Cole Scholarship Fund

All Colleges

The Ruby H. Cole Scholarship Fund was established in 1973 under the will of Mrs. Cole, late of Boston, Massachusetts. The income from the fund is awarded annually to one or more female students enrolled in or admitted to undergraduate programs of the Basic College of the University and who are graduates of Roxbury High School, Roxbury, Massachusetts. Recipients must demonstrate financial need, academic stability, and soundness of character.

**Commercial Union Insurance
Companies Scholarship**

Criminal Justice

The income from this fund, established in 1982 by the Commercial Union Insurance Companies, will be used to provide a scholarship to an entering freshman who demonstrates need and shows promise of success in the law enforcement field.

Community Scholarships

All Colleges

The Community Scholarships were established by President Asa S. Knowles during the period 1963–1973. These scholarships stipulate that Northeastern will ensure that full freshman tuition be met in the form of scholarships and grants for qualified students.

In order to qualify for consideration, a student must apply for financial assistance through the normal application procedure and demonstrate need.

The following Massachusetts communities are designated under this scholarship: Boston, Ashland, Burlington, Brookline, Belmont, Brockton, Framingham, Marshfield, Milford, Norwood, Reading, Revere, Sandwich, Westwood, Weston, and Weymouth.

**The Compugraphic Corporation
Scholarship Fund**

All Colleges

The Compugraphic Corporation Scholarship Fund has been established and endowed at the University with a generous gift from an individual. The income from the scholarship fund is to be used annually as financial assistance for persons who are admitted to or enrolled in full-time undergraduate programs of the Basic Colleges of the University and who demonstrate financial need, academic stability, and soundness of character. Scholarships are tuition grants and are awarded to persons who are otherwise eligible and who are, at the time of the grant, children of current employees of Compugraphic Corporation.

**Arnold L. Cormier
Memorial Scholarship**

Criminal Justice

The Arnold L. Cormier Memorial Scholarship Fund was established in 1980 by Joseph L. and Ruth E. Cormier in memory of their son, Arnold, a student in the College of Criminal Justice, Class of 1981. Arnold was a good student with excellent grades and was an active participant in classroom discussions and college activities.

His untimely death in an automobile accident, while on a weekend trip with two of his classmates, was a tragic loss to his parents and friends. To perpetuate the memory of Arnold Cormier and the spirit of good fellowship for which he stood, this scholarship is awarded annually to a senior in the College of Criminal Justice.

**The Salvatore J. and
Corinne Danca Scholarship**

All Colleges

The Salvatore J. and Corinne Danca Scholarship, established in 1974 by Salvatore J. Danca, a graduate of Northeastern University, Class of 1934, is to be awarded annually to a student enrolled as a sophomore. Selection will be made by the Committee on Scholarships, using academic excellence and financial need as the criteria for selection.

**Elizabeth A. Davey Scholarship
for Physical Therapy**

Boston-Bouvé College of
Human Development Professions

The Elizabeth A. Davey Scholarship for Physical Therapy students was established through the generosity of the family and friends at Choate Memorial Hospital on behalf of Elizabeth A. Davey, as a living memorial to a woman who shared her life with so many people. Income from this fund will be awarded or loaned to a Physical Therapy senior who demonstrates superior academic achievement and financial need.

Charles M. Devlin Scholarship

All Colleges

This fund was established in 1976 by the members of the Class of 1970 "in honor of our dedicated adviser," Charles M. Devlin. The income from the fund will be awarded annually to upperclassmen with proven ability and demonstrable financial need. Preference will be given to children of members of the Class of 1970.

The William O. DiPietro Scholarship

Engineering

This scholarship was established in 1967 through the generosity of Mr. William O. DiPietro, a distinguished alumnus of the College of Engineering and a member of the Class of 1942. The scholarship is awarded to one or more deserving freshmen who demonstrate a high caliber of achievement and a desire to fulfill the limits of their ability in both academic and cooperative periods of study. In considering recipients for this scholarship, preference is given to freshmen enrolled in the College of Engineering who have a desire to major in Chemical Engineering. It is intended that those students receiving awards from this scholarship might someday contribute to this or other scholarships themselves, thereby perpetuating growing funds that will help other deserving individuals.

**The Diamond Anniversary
Development Program Scholarship**

All Colleges

This scholarship has been established to commemorate the successful conclusion of the Diamond Anniversary Development Program. This scholarship fund recognizes the loyalty and generosity of the thousands of alumni and friends, corporations, foundations, and organizations whose significant contributions of time and resources have brought Northeastern University to "that greatness which is its destiny."

Three \$1,000 scholarships are awarded annually, as follows: to one or more full-time students enrolled in a cooperative education program within a basic college of the University, to one or more part-time students enrolled in a basic college of the University, and to one or more full-time students enrolled in the graduate division or a professional school of the University. Consideration will be based upon financial need, academic stability, and soundness of character.

**The Harry Doebla Memorial
Scholarship**

All Colleges

The Harry Doebla Memorial Scholarship was established in 1974 in memory of Mr. Harry Doebla, founder and president of Doebla Greeting Cards, Inc. During his lifetime Mr. Doebla provided much financial assistance to young people of limited means to help them in furthering their educational goals.

The awards from this fund are available to undergraduate day students, with preference being given to graduates of Fitchburg High School, Fitchburg, Massachusetts, and Nashua High School, Nashua, New Hampshire. Additional consideration will be given to children of employees of Doebla Greeting Cards, Inc.

**The Cpl. James B. Downey
USMC Scholarship Fund**

All Colleges

This scholarship was established in 1970 through the generosity of Mr. William J. Downey, a graduate of the College of Liberal Arts, Class of 1952, in memory of his brother, Cpl. James B. Downey, USMC. The scholarship is to be awarded annually to an upperclassman in the day colleges who has demonstrated the necessity for financial aid.

Agnes F. Driscoll Scholarship Fund

All Colleges

This fund will provide scholarship assistance to students in their upperclass years who have demonstrated financial need and scholastic attainment.

**Carl Stephens Ell Alumni
Scholarships**

All Colleges

To honor Dr. Carl Stephens Ell, the second president of Northeastern University, the Alumni Association established these scholarships in 1958. Either freshmen or upperclassmen enrolled at the University are eligible. Awards will be made to worthy students on the basis of scholastic ability and need. The scholarships are to be distributed as equitably as possible among students in the Basic Colleges and University College. Preference shall be given to sons and daughters of Northeastern Alumni.

**Elmer H. and Daisy M. Everett
Memorial Scholarship**

All Colleges

This scholarship was established through a bequest of Elmer H. and Daisy M. Everett, both alumni of Northeastern University. Mr. Everett graduated from the College of Engineering, and Mrs. Everett graduated from the School of Business. They are both members of the Class of 1934. Mr. and Mrs. Everett had a strong commitment to help young people wanting to further their education. The fund will be administered by the Office of Financial Aid.

Michael T. Federico Memorial Fund

All Colleges

The Michael T. Federico Memorial Fund was established in 1982 by the Rhode Island Alumni Club, fellow alumni, and friends of Michael T. Federico, a graduate of the class of 1940 and a life-long resident of the State of Rhode Island. Income from the fund is to be awarded annually to one or more students from Rhode Island who are in their sophomore year, have attained a Q.P.A. of 3.0 or better, and demonstrated financial need.

**The George Raymond Fennell
Memorial Scholarships**

Business Administration

Two full-tuition scholarships are awarded each year to first-year students enrolled in the College of Business Administration. The scholarships are awarded in memory of George Raymond Fennell, formerly Assistant Director of Admissions and Director of the Northeastern Student Union.

**Clara and Joseph F. Ford
Scholarship Fund**

All Colleges

A fund established by Clara and Joseph F. Ford to provide tuition scholarships for worthy, needy, and well-qualified students who have demonstrated a democratic and tolerant spirit and who are well disposed toward people of all creeds and races.

**The Gamma Phi Kappa
Fraternity Scholarship**

All Colleges

The Gamma Phi Kappa Fraternity Scholarship was established in 1972 by the Gamma Phi Kappa Fraternity Alumni Association, Incorporated, and was endowed in 1976 through the generous contributions of Gamma Phi Kappa Fraternity alumni and undergraduates. Awards are made annually from interest on the endowment to undergraduate students enrolled in the basic day colleges of Northeastern University who demonstrate good academic standing and financial need. Undergraduate members of the Gamma Phi Kappa Fraternity are ineligible to apply for this award.

**The Nathan Gerber
Memorial Scholarship**

All Colleges

The Nathan Gerber Memorial Scholarship was established in 1974 by Albert Gerber, E'52, and Robert Gerber, E'60, in memory of their father, Nathan, a member of the Class of 1925. The scholarship is to be awarded annually to a student or students enrolled in the freshman class with a demonstrable financial need. Selection is made by the Committee on Scholarships.

The Foster Grant Scholarship

All Colleges

This scholarship, established in 1974 by the Foster Grant Co., Inc., of Leominster, Massachusetts, is available to students in any of the full-time undergraduate colleges. Preference will be given to children of employees of Foster Grant Co., Inc. Basis for the award will be demonstrable financial need and above-average academic achievement.

Clifton W. Gregg Memorial Scholarship

All Colleges

This scholarship was established through a bequest of Clifton W. Gregg, a 1915 graduate of the School of Commerce and Finance of Northeastern University. It was Mr. Gregg's request that "the income for this fund be used for the assistance of financially needy students." The award may be made annually. Recipients will be determined by the Committee on Scholarships.

Rabbi Myer O. Grunberg Scholarship

All Colleges

Established in 1953 by Mrs. Myer O. and Miss Rose Grunberg, this annual award is available to a senior student in any college of the University. The award is made to students who have evidenced in personal business, and student relations those characteristics of leadership and human relations that make for a better social order. There is no restriction as to race, creed, color, or sex.

Priscilla E. Hargreaves Scholarship

Electrical Engineering

The Priscilla E. Hargreaves Scholarship for Electrical Engineering Students was established by husband William Hargreaves, E'28, as a loving tribute to a wife whose love and devotion meant so much to him. Income from this fund will be awarded to electrical engineering students who have reached their second year and who show a need and have demonstrated reasonable academic responsibility.

Charles W. Havice Scholarship

All Colleges

This scholarship was established by the members of the Student Union upon the retirement of the former Dean of Chapel, Charles W. Havice. The income from the fund is awarded annually to upperclass students who are active in the Student Union. Students should demonstrate a financial need.

Charles Hayden Memorial Scholarships

All Colleges

The Charles Hayden Foundation, created by the will of the late Charles Hayden, an alumnus of the Boston English High School, offers annual memorial scholarships to freshmen at Northeastern University. The scholarships are awarded to "deserving boys" whose parents are unable to finance the entire cost of their education.

Kathryn S. Horbal Scholarship

Chemical Engineering

The Kathryn S. Horbal Scholarship for female chemical engineering students was established by Kathryn's family as a loving tribute to a daughter whose short lifetime meant so much to so many. Income from this fund will be awarded to female chemical engineering students who have reached at least their middler year and who have demonstrated academic responsibility.

Richard Melvin Horwitz Memorial Award for Excellence in Electrical Engineering

Engineering

The Richard Melvin Horwitz Memorial Award for Excellence in Electrical Engineering was established in 1967 by Leonard J. Horwitz in memory of his brother, Richard Melvin Horwitz, a member of the Class of 1945 in the College of Engi-

neering who died in action during World War II. The award recognizes academic achievement and excellence and is presented annually to an outstanding undergraduate senior majoring in Electrical Engineering.

**The Walter F. Howe
Memorial Scholarship**
Business Administration

This fund was established in memory of Walter F. Howe, Class of 1968, who, within one week after graduation, was fatally wounded while pursuing thieves who had stolen his landlord's car. The scholarship was established through the generosity of Walter's friends and relatives in memory of his ideals of good citizenship and civic responsibility. It is awarded annually to a student in the College of Business Administration who demonstrates not only financial need but good citizenship and civic responsibility. The scholarship is open-ended so that additional sums can be added to it in future years and will be awarded by the University without restrictions as to race, color, geographic origin, or scholastic attainment.

The Edward L. Hurtig Scholarship
All Colleges

This scholarship was established in 1968 through the generosity of the Hurtig family in memory of Edward L. Hurtig, an alumnus of the College of Engineering, Class of 1946. The scholarship is awarded annually to an entering freshman in the day colleges who has demonstrated the necessity for financial aid. Preferences will be given to recipients of the Supplemental Educational Opportunity Grants Scholarship Program of the United States Office of Education.

**The Maurice A. and
Nellie L. Idelson Award**
All Colleges

This award, established in 1968, is given annually to an entering freshman in the day colleges who has demonstrated the need for financial aid. Preference will be given to graduates of the Boston English High School. Should there be no qualified candidate from this source, the award will then be given to any worthy student.

**The Jamaican Associates, Inc.,
Scholarship**
All Colleges

The Jamaican Associates, Inc., Scholarship, established in 1981 by the Jamaican Associates, Inc., is awarded annually to a student who is a citizen of Jamaica and who intends to return to Jamaica upon graduation or to a student who is of Jamaican descent. Preference will be given to a second-year student with demonstrable financial need and proven academic performance.

**Joseph Anthony Johnson
Scholarships**
Engineering

Established in 1968 by the will of the late Joseph Anthony (Johansen) Johnson of the Class of 1928, the income provides scholarship aid for students enrolled in the Department of Mechanical Engineering, with preference given to students of Scandinavian origin.

Ralph P. Johnson Scholarship Fund
Electrical Engineering and
Computer Science

Administered by the Office of Financial Aid and awarded to a Computer Science or Electrical Engineering major, this fund was established in 1980 by David R. Johnson, an alumnus of the Class of 1970, in honor of his father. It is the donor's desire that recipients of this fund assume the moral obligation to reimburse the fund in future years as they may be able in order to make additional financial aid available for other students.

**Dr. LeRoy C. Keagle Memorial
Scholarship Fund**

Pharmacy

The Dr. LeRoy C. Keagle Memorial Scholarship Fund was established in 1975 through the generosity of family and friends of Dr. LeRoy C. Keagle, a man of high integrity and commitment to the profession of pharmacy who, at the time of his death on December 15, 1974, was Dean of the College of Pharmacy and Allied Health Professions at Northeastern University. The income from this scholarship fund is awarded annually to a student in the undergraduate Pharmacy Program who is entering the junior or senior class. Recipients must demonstrate financial need, academic stability, and soundness of character.

**Robert G. Keene Memorial
Scholarship Fund**

All Colleges

This fund was established in 1979 in memory of Robert G. Keene, a graduate of Lincoln College, Class of 1972. The endowment funds were provided by the friends and associates of Robert G. Keene and by the Polaroid Corporation, where he served as an Engineering Manager. The income from the fund will be awarded annually to an undergraduate student who demonstrates financial need as well as strong character and initiative. Primary consideration will be given to children of Polaroid employees.

**The Martin Luther King, Jr.,
Scholarship**

The Martin Luther King, Jr., Scholarship is granted annually to incoming freshman, graduate, and transfer minority students who have demonstrated the philosophy of peaceful coexistence and change through nonviolent means espoused by Dr. King and who have an above-average scholastic record. The scholarship, in the amount of \$500, requires a minimum grade point average. Financial aid based on need is available to supplement the scholarship.

**Andrew C. Knudsen
Memorial Scholarship**

The Andrew C. Knudsen Memorial Scholarship was established in 1982 by Johanna M. Knudsen in memory of her beloved brother, Andrew C. Knudsen, LI'52, B'55, who passed away on April 14, 1978. The two recipients should be from the School of Engineering or the Alternative Freshman Program and have demonstrated leadership qualities, proven worthy, and be of good character with a financial need. The awards are to be made annually from the income of the fund.

Vena Morse Lamson Scholarships

All Colleges

These scholarships are provided through the income of a fund established in 1963 by Horatio W. Lamson in memory of his beloved wife. They are awarded annually to needy and worthy students who are enrolled in any of the Basic Colleges of the University. The scholarships are granted by the Committee on Financial Aid of the University without regard to national origin, sex, race, or creed.

**George M. and Irene M. Lane
Scholarship Fund**

All Colleges

This scholarship fund was established in 1979 by the family of Dr. George M. Lane to honor his memory. Dr. Lane's faithful and dedicated service to Northeastern University extended from 1943 to 1975, at which time he retired as Director of University Health Services. The income from the George M. and Irene M. Lane Scholarship Fund is awarded annually to an upperclass member of the University's varsity football or hockey team who demonstrates financial need, academic stability, and soundness of character. Additional family gifts as well as contributions from friends and associates may be added to the scholarship's endowment.

The Irving Landfield Scholarship

All Colleges

This fund was established in 1972 through the generosity of Irving Landfield, a graduate of the School of Commerce and Finance of Northeastern University, Class of 1923. The income from the fund is to be awarded annually to help deserving and needy students who demonstrate a desire to fulfill the limits of their ability in academic and cooperative periods of study. The income from this fund will be administered and awarded by the University without restriction to race, color, creed, geographic origin, or scholastic attainment. It is Mr. Landfield's desire that recipients of the scholarship assume a moral obligation to contribute to the principal of this fund as they may be able, in order to make additional financial aid available for other students in later years.

Avrom Aaron Leve Memorial Scholarship

Psychology

This scholarship fund was established in 1957 in memory of Dr. Avrom Aaron Leve, former Assistant Professor of Psychology. The interest is used annually to provide scholarships for upperclass students majoring in Psychology. The award is made on the basis of academic achievement, financial need, and character.

William F. Linskey Scholarship Fund

All Colleges

This fund was established in March 1980 by alumni and friends of William F. Linskey, an athletic trainer long associated with young athletes in and around the Greater Boston area. A former head trainer for the Northeastern University football team and head hockey coach during the 1942–43 season, Linskey has served the City of Cambridge School Department as head athletic trainer and physical therapist for more than thirty years. The income from the fund will be awarded to worthy students pursuing courses leading to a Bachelor of Science in Education with a specialization in athletic training.

Russell T. Lowe Memorial Scholarship Fund

College of Engineering

This fund was established in 1976 in memory of Russell T. Lowe, a graduate of the College of Engineering, Class of 1953. The endowment funds were provided by the friends and associates of Russell Lowe and by the Barry Wright Corporation, where he served as a member of the Board of Directors and as president of the Industrial and Aero Products Group. The income from the fund will be awarded annually to one or more upperclass students enrolled in the College of Engineering. Preference will be given to Mechanical Engineering majors based upon demonstrable financial need and above-average scholastic achievement.

Gilbert G. MacDonald Scholarship

All Colleges

This scholarship was established in 1981 by the family of Gilbert G. MacDonald, former Vice President for Student Affairs and Dean of Students, and the members of the Student Union. The income from the fund will be awarded annually to upperclass students of proven ability and demonstrable financial need. Preference will be given to students who actively participate in the Student Union.

Dr. Reuben J. Margolin Memorial Scholarship FundBoston-Bouvé College of
Human Development Professions

The Dr. Reuben J. Margolin Memorial Scholarship Fund was established in 1973 through the generosity of family and friends of Dr. Reuben J. Margolin, an outstanding and dedicated individual and friend who, at the time of his death on April 6, 1972, was Chairman of the Department of Rehabilitation and Special Education at Northeastern University.

The income from the Dr. Reuben J. Margolin Memorial Scholarship Fund is awarded annually to a deserving student admitted to or enrolled in the Graduate School of Boston-Bouvé College of Human Development Professions and majoring in Rehabilitation and/or Special Education. Recipients must demonstrate financial need as well as the personal and professional qualities exemplified by Dr. Margolin.

George T. Marvin Scholarship Fund

All Colleges

This fund was established in 1961 under the provisions of the will of George T. Marvin, a graduate of the Northeastern University School of Law, Class of 1918. Mr. Marvin designated that the income of this fund should be used to provide financial assistance to worthy and needy students to assist them in furthering their education at Northeastern University.

George T. Marvin Scholarships may be awarded to new students seeking admission to Northeastern and to students enrolled as freshmen and upperclassmen. Applicants must have satisfactory records of scholarships as of the time of making application and must demonstrate genuine need and good citizenship.

Merchants Tire Company Scholarship Fund

Business Administration

This scholarship was established in 1972 by Merchants Tire Company in honor of Max Katz, a Class of 1917 alumnus of Northeastern and founder and chairman of the board of Merchants Tire Company. The scholarship is awarded annually with selection preference given to a son or a daughter of a current employee of Merchants Tire Company enrolled as a freshman within the College of Business Administration, who demonstrates financial need, soundness of character, and academic stability.

George H. Meserve, Jr., Scholarship Fund

College of Arts and Sciences

This scholarship was established in 1979 through the generosity of Robert W. Meserve in honor of his brother, Professor George H. Meserve, Jr., an alumnus of the Class of 1925. Professor Meserve served Northeastern faithfully and with distinction for forty-two years, retiring in 1968 as Professor and Chairman of the Department of Art. Announced at the ceremony dedicating George H. Meserve Hall on the Boston campus, this scholarship benefits worthy undergraduate students who are majoring in Art. Recipients should demonstrate financial need academic stability, and soundness of character.

The Clyde W. Morrison Scholarship Fund

All Colleges

The Clyde W. Morrison Scholarship was established in 1974 by Clyde W. Morrison, a member of the class of 1942. The scholarship is to be awarded annually to a Braintree resident enrolled as a freshman, with a demonstrable financial need. Selection is made by the Committee on Scholarships.

Frederick W. Muckenhaupt Scholarship

All Colleges

This award was established in 1961 by Dr. and Mrs. Carl F. Muckenhaupt in memory of their son, Frederick W. Muckenhaupt, Class of 1959 of the College of Engineering.

The award is to be made annually to a student in good standing on the basis of need. Preference is given to a student enrolled in the Department of Electrical Engineering.

**Elizabeth A. Neilson
Scholarship**

Boston-Bouvé College of
Human Development Professions

The Elizabeth A. Neilson Scholarship Fund was established in 1976 in memory of William H. and Anastasia Neilson, exemplars of the profession of health education during their lifetimes. The income from the scholarship fund is awarded annually to a student(s) with the highest scholastic record majoring in Health Education, who has completed eight quarters of academic study with at least four quarters having been taken at Boston-Bouvé College of Human Development Professions. The student(s) must typify the philosophy of the health education profession.

**Thomas Anthony Pappas
Scholarship Fund**

All Colleges

This fund was established in 1980 by the Thomas Anthony Pappas Charitable Foundation. Endowment income is to be used to provide scholarship assistance to needy students with high scholastic records.

**Power Systems Engineering
Grants-in-Aid**

Electrical Engineering

A number of public utilities and power equipment manufacturing companies in the northeastern part of the United States have made available grants-in-aid ranging from \$1,000 to \$5,000 to assist able freshmen who are interested in pursuing careers in power systems engineering through study programs leading to the Bachelor of Science or Master of Science in Electrical Engineering degrees. These awards are made on the basis of academic achievement in high school and aptitude for, and interest in, the field of power systems engineering, without regard to financial need.

Candidates for such grants-in-aid should apply to the Dean of Admissions at Northeastern University not later than March 1 of the year in which they wish to enter the College of Engineering.

**Lawrence Harlow Pratt Athletic
Scholarship Fund**

All Colleges

This fund was established in 1979 by the Northeastern University Varsity Club in conjunction with the Athletic Development Program Fund Drive to honor and recognize Lawrence Harlow Pratt. For more than four decades, Larry was the spirit of Northeastern athletics. His greatest joys were the young men he persuaded to attend college. He encouraged them, cajoled them, sometimes scolded them, but always inspired them to complete their intercollegiate careers and go on to become outstanding members of the community. The income from the fund will be awarded annually to financially deserving varsity athlete(s).

**The Gay Miller Reese
Memorial Scholarship**

Boston-Bouvé College of Human
Development Professions

The Gay Miller Reese Memorial Scholarship was established in 1971 by Everett Reese, in memory of his wife, and by members of the Class of 1921 at their 50th reunion in honor of their classmate and class president, Gay Miller Reese. This scholarship is to be awarded annually to help a well-qualified upperclassman in Boston-Bouvé College of Human Development Professions acquire the education that could not otherwise be possible. The recipient of this award will be selected by the Committee on Scholarships.

Regional Scholarships

All Colleges

Secondary school students who reside in rural areas of New England, who have demonstrated superior achievement in their studies, and who are strongly endorsed by their principals and guidance counselors may qualify for a Regional Scholarship. Scholarships range from \$200–\$1,400.

The Myer Riesman Scholarship

Nursing

This fund, established in 1969 in memory of Myer Riesman, is used to provide financial assistance to deserving students in the College of Nursing. Preference is given to those students whose clinical experience is at Beth Israel Hospital.

Edward T. Rigney Scholarship

All Colleges

A fund was established in 1978 by a grant from the Trans-Sonics Foundation in memory of Edward T. Rigney, member of the Class of 1941 and co-founder of Trans-Sonics, Inc. Income is awarded annually to a student showing financial need and promise of success in his/her chosen field and who is enrolled in engineering, science, or science-related studies. The scholarship may be granted to a freshman or upperclassman and may be renewed in succeeding years.

Isedore Rosenthal Fund

College of Business-Administration

The Isedore Rosenthal Fund was established in 1981 by Mrs. Isedore Rosenthal and friends in memory of her husband, a distinguished graduate of the School of Commerce and Finance (1925) and the School of Law (1931). Income from the fund is to be awarded each year, based on financial need, to freshman accounting majors for the purchase of books and materials. It is the donor's desire that recipients assume the responsibility in future years to contribute to the principal of this fund as they may be able, in order to make additional resources available for other students in later years.

Frank B. Sanborn Scholarship Fund

Engineering

The Frank B. Sanborn Scholarship Fund was established in 1958 to provide a scholarship or scholarships of not more than \$500 to worthy and needy students selected by the University, without restrictions as to race, creed, or geographic origin, but with preference being given to students majoring in Electrical, Mechanical, Civil, or Industrial Engineering, in the order stated.

Recipients must be willing to assume a moral obligation to reimburse the fund as they may be able, to make similar financial aid available for other students in later years. There shall be no interest charged and no time specified for reimbursement.

Clinton H. Scovell Scholarships

Boston-Bouvé College of Human

Development Professions

Scholarships are made available to men and women students in Boston-Bouvé College of Human Development Professions through a fund provided by the will of Clinton H. Scovell.

Joseph M. Segel Scholarship

All Colleges

This scholarship fund was established January 9, 1981, by Martin F. Walsh, '52, and his wife, Pauline, to honor Joseph M. Segel on the occasion of his birthday. In 1964 Mr. Segel founded The Franklin Mint, which today is the nation's largest privately-owned mint.

The entrepreneurial ethic of Mr. Segel is much the same as that demonstrated by many Northeastern alumni. It therefore is Mr. Segel's desire that recipients of this award demonstrate this quality and also show financial need.

**The Sidney L. Sholley
Memorial Scholarship**

All Colleges

The Sidney L. Sholley Memorial Scholarship has been established in memory of the founder and first president of Keystone Custodian Funds, Inc. Each year the trustees of the Sholley Foundation, Inc., provide a scholarship of \$3,500 to be awarded by the University to an outstanding incoming freshman student. The recipient is known as the Sidney L. Sholley Scholar.

**George A. and Lorraine C.
Snell Scholarship**

All Colleges

This fund was established in 1973 by Mr. George A. Snell, a graduate of the College of Engineering, Class of 1941, and a member of the Northeastern University Corporation and Board of Trustees, and his wife, Lorraine C. Snell.

The income from the fund is to be awarded annually to one or more students enrolled in the basic colleges of Northeastern University. Selection will be made by the Committee on Scholarships based upon those candidates who demonstrate financial need, academic stability, and soundness of character.

**John Stuart Sousa, Jr.,
Memorial Scholarship Fund**

Pharmacy

This scholarship was established in 1968 in memory of John S. Sousa, Jr., of Fall River, Massachusetts, a student in the College of Pharmacy, Class of 1969, by his family and friends. The scholarship is awarded annually with selection preference given to a male or female student entering his/her senior year in the College of Pharmacy and Allied Health Professions who has obtained a cumulative quality-point average of 2.300, demonstrates financial need, participates in extracurricular activities, and is, preferably, a member of a fraternity or sorority.

**Southeastern Massachusetts
Pharmaceutical Association
Scholarship Fund**

Pharmacy and Allied Health Professions

This scholarship was established in 1980 by the Southeastern Massachusetts Pharmaceutical Association. The income from the fund is awarded annually to one or more middle, junior, or senior students enrolled in the College of Pharmacy and Allied Health Professions who are residents of the area covered by the Southeastern Massachusetts Pharmaceutical Association (Greater Fall River, Greater New Bedford, and the Cape Cod areas). Recipients must be Pharmacy majors and must demonstrate financial need, academic stability, and soundness of character.

**Lillian M. Spelman
Memorial Scholarship**

Nursing

This scholarship was established in 1979 by a bequest from Lillian M. Spelman, a resident of Boston who, as a public health nurse, dedicated her life to helping others. Her career began in the West End of Boston in the early 1900s. She served her country unselfishly as a Red Cross nurse in Europe during the First World War. Through this scholarship she continues to help others. Scholarship recipients must exhibit financial need as well as academic stability and soundness of character.

Spofford Scholarship Fund

All Colleges

The Spofford Scholarship is awarded annually to an American Negro, American Indian, or multiracial freshman who demonstrates severe financial need.

**The Stop & Shop
Companies, Inc.,
Student Loan Fund**
All Colleges

Established in 1974 by The Stop & Shop Companies, Inc., the Student Loan Fund is a combination endowment and revolving fund to be funded by \$100,000. This generous gift recognizes the contribution, in human terms, made through the years by Northeastern to Stop & Shop, which at the time the Loan Fund was established counted more than 120 Northeastern men and women in its executive ranks, seven of them vice presidents.

The Loan Fund will assist students who have a substantial investment in their education but are in need of some financial stimulus to aid them in completing their work.

**Student Loan Fund—
Health Professions**

Boston-Bouvé College of
Human Development Professions,
Nursing, and Pharmacy and
Allied Health Professions

In 1974, a foundation established a perpetual loan fund at Northeastern University to benefit full-time students enrolled as middlers, juniors, and seniors in Boston-Bouvé College of Human Development Professions, the College of Nursing, and the College of Pharmacy and Allied Health Professions. This loan fund will aid those students who have a substantial investment in and commitment to the health professions and who require some financial help to complete their preparation.

**Ruth Page Sweet
Scholarship Fund**

Boston-Bouvé College of
Human Development Professions

This fund was established in 1959 by members of the Class of 1919 and alumnae of the Bouvé-Boston School in honor of their classmate, Miss Ruth Page Sweet, Dean of Women in the School from 1929 to 1946, Administrative Director from 1946 to 1948, and Director from 1948 to 1958. The scholarship is presented to a junior or senior who has demonstrated a high level of professional promise indicated by academic record and extracurricular activities.

Alice Taylor Scholarship
All Colleges

Northeastern University recognizes that Alice Taylor, who passed away in 1982, is remembered as a positive force by the Mission Hill community and even more by the tenants of the Mission Hill Extension housing development. Because of Ms. Taylor's contributions, the University has made available to five freshmen who are residents of Mission Hill Extension, full tuition Alice Taylor Scholarships for the freshman year.

**A. Gilbert Tenney
Scholarship Fund**
Engineering

This fund is in memory of A. Gilbert Tenney, who served as a captain in the Air Force during the Korean War and was killed while in active service. The income from the fund will be awarded to a needy student or students in the field of electrical engineering studying under the Cooperative Plan of Education.

**The Earl H. Thomson
Memorial Scholarship**
All Colleges

This fund was established in 1971 to honor the memory of Earl H. Thomson, a distinguished alumnus of the Class of 1925. Mr. Thomson became an internationally known trademark attorney as senior partner in the firm of Thomson and Thomson. A member of the Northeastern Corporation since 1958 and a Trustee of the University since 1960, he was also a Director of The National Council, former President of the Northeastern Alumni Association, and a member of the Board of Directors of Nu Epsilon Zeta fraternity.

This scholarship is awarded annually to one or more deserving and needy students enrolled as freshmen and/or upperclassmen who demonstrate a desire to fulfill the limits of their ability in academic and cooperative periods of study. The scholarship is open-ended so that additional sums can be added to it in future years and will be administered and awarded by the University without restrictions as to race, creed, geographic origin, or scholastic attainment. It would be Mr. Thomson's desire that scholarship recipients assume a moral obligation to reimburse this or other scholarship funds as they may be able, in order to make additional financial aid available for other students in later years.

**The Eliot F. Tozer
Memorial Scholarship**
Business Administration
and Engineering

This fund was established in 1972 through the generosity of the members of the Class of 1931 in memory of their faculty adviser, Eliot F. Tozer. The scholarship of \$750 is awarded annually to students of proven need in the middler, junior, or senior classes of the day colleges of Engineering or Business Administration. The scholarship is open-ended so that additional sums can be added to it in future years, and will be administered and awarded by the University without restrictions as to race or creed.

Charles Irwin Travelli Scholarships
All Colleges

Numerous scholarships have been given yearly since 1932 to students demonstrating financial need, high academic achievement, and an active interest in University life as shown by participation in one or more major activities. Students are usually honored as recipients of Travelli Scholarships at the completion of their freshman year. Under normal circumstances, these awards will continue through the senior year.

Trustee Scholarships
All Colleges

Established in 1928 by the Board of Trustees of Northeastern University, these full- and partial-tuition scholarships are granted in the Basic Colleges each year to entering freshmen who have demonstrated superior scholastic attainment throughout their preparatory or high school courses.

**Robert E. Turner
Memorial Scholarship Fund**
Business Administration

This scholarship fund was established in 1978 through the generosity of family, friends, and colleagues in memory of Robert E. Turner, a 1952 graduate of Northeastern's College of Business Administration who was associated with the University for eighteen years. The income from this fund is awarded annually to assist a College of Business Administration undergraduate student majoring in accounting who demonstrates financial need, academic stability, and soundness of character.

**Samuel Ulman
Scholarship Fund**
All Colleges

This fund was established in 1960 by Mrs. Samuel Ulman in memory of Samuel Ulman, a student at Northeastern University from 1912 to 1915. The purpose of the fund is to provide scholarship assistance to students in good academic standing who have financial need.

University Scholarships
All Colleges

Northeastern University has for many years maintained a scholarship fund for deserving qualified students. These scholarships are awarded on the basis of need, scholastic standing, and campus citizenship. The recipient of a Northeastern scholarship must be willing to assume a moral obligation to repay the University at some future date.

**The UPS Foundation
Scholarship Fund**

Business Administration

This endowed fund was established in 1982 by the UPS Foundation, the sponsored foundation of United Parcel Services, Inc. The income from this fund is awarded annually to undergraduate students enrolled in the College of Business Administration who demonstrate financial need, academic stability, and soundness of character. In providing scholarships, preference is given to students majoring in the transportation concentration or planning to enter the transportation industry.

**Sabestino Volpe
Scholarship Fund**

Engineering

The Sabestino Volpe Scholarship Fund was established in 1972 through the generosity of Mr. Sabestino Volpe, a distinguished alumnus of the College of Engineering and a member of the Class of 1928. The income from the fund is awarded annually as a scholarship to an upperclass student enrolled in the day Civil Engineering degree program within the College of Engineering. Recipients must demonstrate financial need, academic stability, and soundness of character.

**Henry Ellis Warren
Scholarship Fund**

All Colleges

This endowed fund was established in 1981 by the Warren Benevolent Fund, Inc., to honor the memory of Henry Ellis Warren of Ashland, Massachusetts. The income from this fund is awarded annually to undergraduate students who demonstrate financial need, academic stability, and soundness of character. In providing scholarships, preference is given to students from Ashland or contiguous communities.

**The Jacob Wasserman
Scholarship**

Pharmacy

Established in 1966 by his friends in memory of Jacob Wasserman, this fund is to provide scholarship aid to a senior student in the College of Pharmacy and Allied Health Professions. The award will be made annually on the basis of financial need, academic performance, and personal qualities.

**Robert W. Yesucevitz
Memorial Scholarship**

Criminal Justice

This scholarship fund was established in 1983 in memory of Robert W. Yesucevitz, a federal police officer employed by the United States Federal Protective Service. Officer Yesucevitz was killed in the line of duty while serving at the John F. Kennedy Presidential Library, and this memorial was created by his family and friends, including many police officers. The income from the fund is awarded annually to a first-year student in the College of Criminal Justice who demonstrates academic promise and financial need.

Other Scholarships

The following scholarships are funded by outside sources. Traditionally, Northeastern University students have been awarded these funds.

Recommendation for the specific award is made by one of the several college scholarship committees or the departments concerned, in conjunction with the Office of Financial Aid. If you feel you are a potential recipient for any of these awards, notify your financial aid counselor in writing.

**Dr. Martin E. Adamo
Scholarship**
Pharmacy

This scholarship of \$100 is given annually by the Boston Association of Retail Druggists in memory of Dr. Martin E. Adamo, the second president of the New England College of Pharmacy.

**American Foundation for
Pharmaceutical Education
Scholarships**
Pharmacy

The Board of Grants of the American Foundation for Pharmaceutical Education provides \$600 to be drawn upon to aid qualified students in the upper three years who are in the upper quarter of their class and who maintain a "B" or higher grade average. It is understood that the students have received or are eligible to receive assistance in an amount at least equal to the grant provided by the Foundation from other University sources in payment of required college expenses. The use of the grant is restricted to the payment of tuition or other required college fees. The recipients are identified as "Scholars of the American Foundation for Pharmaceutical Education."

**The Boston Paper Trades
Association, Inc., Scholarship**
Business Administration

Established in 1966 by the Boston Paper Trades Association, Inc., this is an annual scholarship awarded to a junior or senior who has demonstrated, by cooperative work achievement and extracurricular activities, an interest and potential in the field of sales. The recipient must be of high character, have a good academic record, and be able to demonstrate financial need.

**Boston Society of Civil
Engineers Scholarship
In Memory of
Desmond FitzGerald**
Civil Engineering

In 1931, the Boston Society of Civil Engineers established a scholarship in memory of Desmond FitzGerald, a former president of the Society and eminent hydraulic engineer with a distinguished record of service.

It has been awarded annually since 1931 to an outstanding Northeastern University senior or junior student in the Department of Civil Engineering of the College of Engineering. The presentation is made by the president of the Boston Society of Civil Engineers at the Society's annual meeting in the spring.

**Burroughs Wellcome
Revolving Loan Fund**
Pharmacy

A revolving loan fund was established by the Burroughs Wellcome Pharmacy Education Program to assist deserving pharmacy students in the completion of their education. This fund is established through the assistance of Richard M. Walent, Sheldon Rubin, Fred Matula, Daniel Venuti, and James Harb, members of the National Association of Retail Druggists.

**The William M. Cavanaugh
Memorial Scholarship**

All Colleges

This award, established by the members of the Publicity Club of Boston, is open to men and women of the junior and senior classes who demonstrate talent in the field of communications. The scholarship of \$100 bears the name of the second president of the Publicity Club (1950–1951), who was an able and successful newspaperman.

**Civil Engineering
Department Award**
Civil Engineering

The Civil Engineering Department Award was established by members of that Department to recognize achievement and give financial assistance to a student who has selected a major in the field of Civil Engineering. This award, in the amount of \$100, is financed by gifts from members of the Civil Engineering Department and is awarded to the recipient at the beginning of the sophomore year.

**Consumer Value Stores
Scholarship**
Pharmacy

Preference will be given to a student entering the senior year who will be seeking a career in community pharmacy practice. Students who are working or have worked for Consumer Value Stores will be given added consideration. The final selection will be made on the basis of demonstrated financial need, personal qualifications, and a sound academic record. Two \$500 scholarships are offered each year.

**Electrical Manufacturers
Representatives Club of New
England, Inc., Scholarship**
Electrical Engineering

Established in 1958, this scholarship of \$475 is granted to a student or students majoring in Electrical Engineering, without regard to race, creed, or color. To qualify, students must have real financial need and excellent scholastic standing.

**Frissora Family
Scholarship
Award**

Engineering (Science majors)

This award was established by the Frissora family in 1972. Awards are made to freshmen entering Northeastern University, based upon their high school scholastic record and financial need. Preference is given to students of Italian-American extraction who are pursuing an education in a technically oriented curriculum such as engineering, science, mathematics, premedicine, or nursing.

Application for this scholarship award must be made through the Grand Lodge of Massachusetts, Order Sons of Italy in America, 126 Cambridge Street, Boston, Massachusetts. Students selected will receive a grant of \$300 per year for four years. Funds will be paid directly to Northeastern University.

**Gillman Brothers, Inc.,
Scholarship**
Pharmacy

This scholarship of \$250 is given annually by Gillman Brothers, Inc., to help students further their education in pharmacy.

**Massachusetts State
Pharmaceutical Association
Scholarship**

Pharmacy

This scholarship of \$200, established by the Massachusetts State Pharmaceutical Association, is awarded annually. The recipient must be a resident of Massachusetts.

The Massachusetts State Pharmaceutical Association also awards a number of scholarships of \$100. Applications for those scholarships may be secured from the office of the Association at 11 Beacon Street, Boston.

**McKesson and Robbins, Inc.,
Scholarship Award**

Pharmacy

This award of \$200, given annually by McKesson & Robbins, Inc., is awarded to a worthy student who is in financial need. The award recipient is determined by the College of Pharmacy Scholarship Committee and the Office of Financial Aid.

**The New England Paper
Merchants, Inc., Scholarship**

All Colleges

Established in 1959 by the New England Paper Merchants Association, Inc., this is an annual scholarship awarded to a junior or senior who has demonstrated by cooperative work achievement and extracurricular activities an interest and potential in the field of sales. The recipient must be of high character, be able to demonstrate financial need, and have a good academic record.

**Norfolk County Pharmaceutical
Association Scholarship**

Pharmacy

This scholarship of \$50 is awarded annually to a student who meets the requirements both financially and scholastically and is a resident of one of the member towns covered by the Norfolk County Pharmaceutical Association (Norwood, Dedham, Canton, Walpole, Millis, Needham, Westwood, and Islington, in Massachusetts).

**Connecticut Alumni Rudolf O.
Oberger Scholarships**

All Colleges

Each year the Connecticut Alumni Club awards scholarships to students from Connecticut who have achieved a high academic average in their freshman year and have demonstrated financial need. The scholarships are to be used toward the tuition expense of the sophomore year. These scholarships were established in 1958 to promote Northeastern University among the preparatory schools of Connecticut and, in 1971, were named to honor Rudolf O. Oberger, the former Director of Alumni Relations.

The Phi Kappa Phi Scholarship

All Colleges

Established in 1982 by the University's Chapter of Phi Kappa Phi, the national interdisciplinary honor society, the scholarship is available to a student transferring from Roxbury Community College. The nomination is made by the President of Roxbury Community College in accordance with criteria established by the University's chapter.

**South Middlesex
Pharmaceutical Association**

Pharmacy

This tuition scholarship of \$100 established in 1960 is awarded annually to a pharmacy student enrolled in the third, fourth, or fifth year who is in good scholastic standing and in financial need, and living in the area covered by the South Middlesex Pharmaceutical Association (Arlington, Belmont, Lexington, and Watertown, Massachusetts). The recipient will be selected by the Scholarship Committee.

**South Shore Pharmaceutical
Association Scholarship**

Pharmacy

In June of each year, the Scholarship Committee of the Association will select a freshman living in the area covered by the South Shore Pharmaceutical Association (Quincy, Braintree, Weymouth, Hull, Randolph, Hingham, Holbrook, and Cohasset, Massachusetts), who will be awarded a \$100 scholarship to be applied to the tuition of the first semester of the sophomore year.

**Ernest L. Spencer
Scholarship Award**

Civil Engineering

Established in 1975 by the family and friends of Ernest L. Spencer as a memorial, this award is administered by Ci Epsilon, honor society for civil engineers. Professor Spencer, chairman of the Civil Engineering Department from 1963 until his death in 1975, was a member of the Northeastern University faculty for 36 years.

At the present time income from the endowment provides an annual award of \$500. Nominees are selected from the senior class of Civil Engineering students by the department scholarship committee. Criteria on which the award is based include high academic achievement, active participation in student affairs, and evidence of superior professional promise as demonstrated by high evaluations on cooperative work assignments.

**Springfield Druggists'
Association Scholarship**

Pharmacy

A scholarship of \$100 is offered by the Springfield Druggists' Association. This is to be awarded to a sophomore or junior who maintains the highest average in the Department of Pharmacy and who is worthy and in need of financial assistance. The Springfield Druggists' Association Scholarship Fund was established in 1956.

Honor Societies and Awards

Honors and Awards

The University encourages the achievement of excellence in scholarship by making monetary awards and chartering honor societies in the various academic disciplines.

Honor Societies

The following honor societies are chartered in the Colleges:

The Academy—in the College of Arts and Sciences

Alpha Kappa Delta—in the College of Arts and Sciences, Department of Sociology and Anthropology

Alpha Phi Sigma—in the College of Criminal Justice

Alpha Pi Mu—in the College of Engineering, Department of Industrial Engineering and Information Systems

Beta Alpha Psi—in the College of Business Administration, Accounting concentration

Beta Gamma Sigma—in the College of Business Administration (Massachusetts Delta Chapter)

Boston-Bouvé College of Human Development Professions Honor Society—in the College, all Departments

Chi Epsilon—in the College of Engineering, Department of Civil Engineering

Delta Phi Alpha—national German honor society

Eta Kappa Nu—in the College of Engineering, Department of Electrical Engineering (Gamma Beta Chapter)

Kappa Delta Pi—in the Boston-Bouvé College of Human Development Professions

Omega Chi Epsilon—in the College of Engineering, Department of Chemical Engineering
Phi Alpha Theta—in the College of Arts and Sciences, Department of History (Northeastern Zeta Tau Chapter)
Phi Kappa Phi—national interdisciplinary honor society
Phi Sigma—in the College of Arts and Sciences, Department of Biology
Phi Sigma Iota—in the College of Arts and Sciences, Romance Languages (Iota Zeta Chapter)
Pi Sigma Alpha—in the College of Arts and Sciences, Department of Political Science (Northeastern Delta Gamma Chapter)
Pi Tau Sigma—in the College of Engineering, Department of Mechanical Engineering (Northeastern Tau Chapter)
Rho Chi Society—in the College of Pharmacy and Allied Health Professions (Beta Tau Chapter)
Sigma Epsilon Rho—in University College
Sigma Theta Tau—in the College of Nursing
Sigma Xi—Scientific Research Society of North America
Tau Alpha Pi—in Lincoln College (national engineering technology honor society)
Tau Beta Pi—in the College of Engineering (Massachusetts Epsilon Chapter)

Election to the college honor societies is based primarily upon scholarship, but, before a man or woman is privileged to wear the honor society insignia, there must be evidence of an integrity of character and an interest in the extracurricular life of the University. The societies have memberships consisting of the outstanding men and women in the colleges. Election to an honor society is the highest honor that can be conferred upon an undergraduate.

Awards for Upperclassmen

University awards are determined by scholastic and citizenship achievement. They are presented by appropriate committees headed by the Dean of Students.

The Academy Award Arts and Sciences

The Academy, the honor society of the College of Arts and Sciences, offers an annual award of \$100 to the sophomore in the College of Arts and Sciences who, during the previous year as a freshman, achieved the highest scholastic record.

William Jefferson Alcott, Jr., Award All Colleges

This award of \$200 was established in 1934 by members of the faculty and other friends to perpetuate the memory of William Jefferson Alcott, Jr., a brilliant member of the Northeastern Department of Mathematics from 1924 until his death in 1933. The annual award to a senior is made from the income of the fund "for outstanding performance, either in the way of unusual excellence in routine work or in connection with some intellectual activity outside or beyond the requirements of the curriculum."

Alumni Awards for Professional Promise All Colleges

Established in 1947 by the Alumni Association, these awards are presented annually at an Alumni Association meeting in the spring of the year. The awards are made to the outstanding seniors in each of the Basic Colleges and in University and Lincoln Colleges who have demonstrated unusual professional promise through their character traits, scholastic achievement, and cooperative work performance.

**The Beta Gamma Sigma
Society Award**

Business Administration

"The purpose of this society shall be to encourage and reward scholarship and accomplishment among students of business administration, to promote the advancement of education in the art and science of business, and to foster integrity in the conduct of business operators."

Election to membership in Beta Gamma Sigma is the highest scholastic honor open to a student in business administration.

The Massachusetts Delta Chapter of Beta Gamma Sigma, the national honor society of colleges of business administration, offers an annual scholarship of \$100 to the sophomore in the College of Business Administration who, during the previous year as a freshman, achieved the highest scholastic record.

**Boston-Bouvé College of
Human Development
Professions
Honor Society Awards**

Boston-Bouvé College of
Human Development Professions

The Society offers an annual award of \$100 to the sophomore in Boston-Bouvé College of Human Development Professions who, during the previous year as a freshman in the College, achieved the highest scholastic record. Each student voted into the Society receives an engraved certificate at a special Honors Assembly.

**Cooperative Education
Awards**

All Colleges

These awards are presented to seniors in the Basic Colleges in recognition of outstanding performance in the Cooperative Education Program, through which they have personified the objectives and ideals of the University. The awards are presented at the Annual Awards Luncheon.

**Sears B. Condit
Honor Awards**

All Colleges

These awards were established in 1940 through the generosity of Sears B. Condit. On Honors Day, Sears B. Condit Honor Awards are presented annually to outstanding students in the senior class. Each award carries a stipend as well as a certificate of achievement.

**Joseph Arthur Coolidge
Achievement Awards**

Physical Sciences

Established in 1977 with funds provided by the will of Joseph A. Coolidge, a distinguished member of the Northeastern University faculty from 1911 to 1954 and Chairman of the Department of Physics from 1912 to 1935, three awards of \$500 each are granted annually to the outstanding sophomore, middler, and junior physical sciences students. These awards are based primarily on distinguished academic achievement, with additional consideration given to soundness of character, participation in extracurricular activities on and off campus, and qualities of leadership. Preference will be given to students majoring in physics, mathematics, or other physical sciences.

**Richard Cardinal Cushing
Scholarship**

All Colleges

The Richard Cardinal Cushing Scholarship was established in 1978 through the generosity of the Massachusetts Committee of Catholics, Protestants, and Jews. The income from the scholarship's endowment will be awarded annually to a Catholic, a Protestant, and a Jewish student who embody the principles of brotherhood and justice and who, through their work on campus, have become positive forces for religious understanding.

Director's Award

The Director's Award of \$100 is made annually by the Director of the African-American Institute to the individual judged by the Director to be the most outstanding black senior. The award is based on involvement in African-American Institute programs and scholarship, as well as interaction with the community at large. The award is presented at the Awards and Unity Banquet in June.

Alfred J. Ferretti Award

Engineering

Tau Kappa Chapter of Pi Tau Sigma, the Mechanical Engineering national honor fraternity, sponsors an annual award to the sophomore mechanical engineering student at Northeastern having the highest scholastic standing. The award is named in honor of Professor Ferretti, who retired June 30, 1961, after forty-three years of service to the University.

**Alfred J. and Laura M. Ferretti
Scholarship**

Engineering

This scholarship was established in 1978 by Professor Alfred J. Ferretti, who retired in 1961 after forty-three years of service to Northeastern University. It honors the memory of Mrs. Ferretti and is to benefit worthy undergraduate students who are majoring in Mechanical Engineering. Recipients should demonstrate high academic achievement by maintaining a minimum average of 3.0 and should be of sound character.

**Luis de Flores
Endowment Fund**

All Colleges

This fund was established in 1964 to provide yearly awards to students in recognition of superior ingenuity, irrespective of general academic standing.

**Clara and Joseph F. Ford
Awards**

All Colleges

The Ford Awards are made to students who have shown a democratic and tolerant spirit and who are well disposed toward people of all creeds and races. They are chosen from the senior class and judged on the basis of their contributions through participation or leadership and their extracurricular organizations. Students must have demonstrated by their actions that they are particularly tolerant and willing to work with and for other people.

**The Harold D. Hodgkinson
Achievement Awards**

All Colleges

Established in 1954, the Harold D. Hodgkinson Achievement Awards of \$1,000 each are granted annually to a senior student in Division A and Division B. The winners of the awards are known as the Hodgkinson Scholars for the year in which they are chosen.

The award is based primarily upon distinguished scholastic achievement with due consideration of character, personality, qualities of leadership, cooperative work experience, military record (if any), and service in voluntary organizations and activities. Student leadership accomplishments and professional potential are evaluated in connection with these criteria.

The Hodgkinson Scholars are chosen by a committee of administrative members of the faculty. An appropriate certificate is presented to each recipient as a permanent record of his/her selection.

Kappa Delta Pi Award

Boston-Bouvé College of
Human Development Professions

Kappa Delta Phi honor society offers an annual award of \$100 to the sophomore who, during the freshman year, achieved the highest scholastic record.

Robert D. Klein Memorial Scholarship

Arts and Sciences

This scholarship was established in 1981 through the generosity of family, friends, and colleagues of Professor Klein, who joined the Northeastern University faculty in 1957, served as acting chairman of the Department of Mathematics between 1969 and 1970 and, from 1977 until his death in 1978, was a professor of mathematics. The scholarship is awarded annually to a freshman student enrolled in the College of Arts and Sciences who demonstrates consistent effort and academic achievement in remedial mathematics, the educational program to which Professor Klein contributed so significantly.

The Lilly Achievement Award

Pharmacy

The Lilly Achievement Award is given to a graduating senior for superior scholastic and professional achievement. Leadership qualities, professional attitudes, and academic performance will be considered in the selection of the individual for this award.

Julia and Merrill Robert Lovinger Award

All Colleges

This annual \$100 award was established in 1960 by William Lovinger for the purpose of giving assistance to a student of acceptable scholastic standing who can demonstrate financial need.

Robert Lubets Award

Business Administration

The award was established in 1953 by the Boston accounting firm of Robert Lubets & Company to recognize outstanding professional development and personal growth by students training for careers in accounting. Two hundred dollars will be awarded to a degree candidate who, at the completion of the junior year, has demonstrated the greatest personal growth and professional development as evidenced by improvement in scholastic achievement accompanied by professional aptitude indicative of future success as an accountant.

McKesson & Robbins, Inc., Scholarship

Pharmacy

This scholarship of \$200, given annually by McKesson & Robbins, Inc., is awarded to a worthy student in financial need.

Susan L. Orchard Memorial Fund

All Colleges

In 1978, the Susan L. Orchard Memorial Fund was established at Northeastern in memory of Susan L. Orchard, a former University student. Reflecting Susan's interest in improving the quality of life and opportunities for women, the annual income of this fund will be awarded to mothers pursuing their studies at Northeastern who require financial assistance in order for their children to make use of the University's Day Care Center. Recipients will be selected by the Center's Director and Advisory Committee.

**Ruth E. Phalen Memorial
Award Fund**
All Colleges

This fund was established in 1959 by Thomas E. Phalen, Jr., a member of the faculty, in memory of his wife. The income from this fund is used yearly as a cash award to a senior, junior, or middler, preferably in the College of Engineering, who maintains at least a 2.0 academic average, shows outstanding ability in one or more varsity sports, and demonstrates excellent campus citizenship.

The Phi Sigma Society Award
Arts and Sciences

Phi Sigma, honor society in the Department of Biology, offers an annual award of \$50 to the junior or senior majoring in biology or a related science who demonstrates the greatest research potential. To qualify for the award, the student must be a member of Phi Sigma.

**Roland Guyer Porter
Memorial Fund**
Electrical Engineering

This fund was established in 1953 by colleagues and friends of the late Professor Roland G. Porter, for many years the head of the Department of Electrical Engineering. Interest from the fund provides an annual award to a student in the Department of Electrical Engineering who best exemplifies the qualities of mind and character that Professor Porter did so much to develop in his lifetime.

President's Awards
All Colleges

On the annual Honors Day, six awards of \$200 each, known as the President's Awards, are presented to the students with the highest records in both divisions of the sophomore, middler, and junior classes.

The William Rand Award
Engineering

The Massachusetts Epsilon Chapter of Tau Beta Pi annually offers an award to the outstanding middler in the College of Engineering. The award is based upon outstanding scholarship, breadth of interest, and contribution to the University. All middleers with a 3.5 average or above are eligible; the winner is chosen after careful screening and interviews with members of the chapter.

**The Mildred A. Reardon
Scholarship Award**
All Colleges

Delta Pi Alpha Sorority sponsors an annual award of \$100 to a deserving female student in the Basic Colleges. Selection is made by the Dean of Students on the basis of academic standing and other considerations. The award is given in honor of an outstanding alumna of Northeastern and Delta Pi Alpha, whose academic excellence, strength of character, and qualities of leadership have typified the ideal for which the sorority strives.

ROTC Awards
ROTC

Awards totaling \$1,000 are available to ROTC cadets each year. The University offers ten \$50 awards annually—four to sophomores, four to middleers, and two to juniors.

Scabbard and Blade (the cadet officers' honor society) offers one award annually to middleers. The Pershing Rifles (the basic-course honor society) offers a \$50 award to a sophomore Pershing Rifles cadet.

Academic Achievement Awards are won by each cadet in the top 10 percent of ROTC classes. The award, a wreath, is worn above the right breast pocket of the uniform during the year immediately following the year it is earned. Leadership Achievement Awards, consisting of letters of commendation, are awarded to each cadet in the top 10 percent in leadership potential.

Many medals and trophies are also awarded by other organizations to ROTC cadets for achievements in diverse fields.

Nguzo Saba Award

Two Nguzo Saba Awards are presented each year by the African-American Institute to the black male and female who have proved themselves of invaluable service to the black community of Northeastern University and Boston. The award is in the amount of \$100 and is presented at the Awards and Unity Banquet.

Sigma Theta

Nursing

Sigma Theta, the honor society in the College of Nursing, annually offers an award of \$100 to the sophomore in the College of Nursing who, during the previous year as a freshman, achieved the highest scholastic record.

**Professor Joseph Spear Fund
for Excellence in Student
Activities**

This fund was established by the College of Engineering Class of 1923 in recognition of Professor Spear, class adviser and mentor. It was through Professor Spear's devotion and concern for the well-being of the students that he developed and promoted student activities at Northeastern University. Professor Spear has been referred to as the "Father of Student Activities." The purpose of this fund is to provide a source of income that can be awarded annually to juniors and seniors who have made outstanding contributions to student activities.

Max Starr Award

Business Administration

The Max Starr Award in Public Accounting was established in 1968 by the Max Starr Foundation to recognize every other year an outstanding member of the junior class in the College of Business Administration preparing for a career in public accounting. The recipient is chosen on the basis of both academic and cooperative work records as well as personal qualities. The student receives awards of \$250 in both the junior and senior years.

**The Dr. Ruth E. Sullivan
Memorial Scholarship Fund**

Arts and Sciences

This fund was established at Northeastern University in 1976 through the generosity of family, friends, and colleagues of Dr. Sullivan, who was a member of the Department of English from 1968 until her death in 1976. One scholarship is awarded annually to an undergraduate senior who demonstrates academic achievement and excellence in interdisciplinary studies in the liberal arts, such as literature and psychology, the fields to which Dr. Sullivan contributed so significantly.

Tau Beta Pi Award

Engineering

Massachusetts Epsilon Chapter of Tau Beta Pi Association, national honor society in engineering, annually offers a scholarship of \$100 to the sophomore in the College of Engineering who, during the previous year as a freshman, made the highest scholastic record.

Housing

Residence Halls

Northeastern University's location, in one of the most central and exciting sections of Boston, offers the student an opportunity to participate in many cultural and educational activities. With residence halls on the Back Bay campus, between the Museum of Fine Arts and Symphony Hall, the city is at your doorstep. Northeastern's library, student center, and athletic facilities are nearby.

Most of the residence halls have lounge areas and recreation rooms, including color television. Privacy and a quiet study environment are encouraged, but students must recognize that residence hall living cannot provide the privacy and quiet they may enjoy in their own homes. However, the benefits, as well as the occasional inconveniences of living in a community, may contribute to personal growth.

A natural advantage of residence living may be the increased involvement in social and educational activities. Students are encouraged to join the committees that make decisions about student life.

Full- or part-time residence hall staff reside in each residence facility.

Housing Application and Contract

Students requesting University housing on their application for admission will receive a housing application with their certificate of acceptance: It must be returned with the required \$100 nonrefundable housing deposit to the Office of the Bursar, 245 Richards Hall. Assignments, which are made on a first-come, first-served basis, are mailed after receipt of payment of an additional \$400 nonrefundable room-assignment deposit.

A housing contract will be distributed after the application and deposits are received by the established deadline. The freshman contract is for three full quarters; upperclass transfer students must file applications on a quarterly basis as their contract is valid for only one quarter at a time. The upperclass deposit is \$250. Contracts for summer-quarter freshmen are handled on an individual basis in accordance with the student's academic schedule.

Married Student Housing

No University housing is available for married students. However, the University does maintain listings of off-campus rooms and apartments. These are available at the Housing Office, 104–106 Ell Building. **Though the Housing Office has agreed to make this listing available, we do not inspect or endorse the advertised property or space.**

Graduate Student Housing

Full-time graduate students enrolled in a graduate program may reside in a University apartment facility. Assignments are made on a first-come, first-served basis after an application and deposit of \$250 are received. The housing contract for graduate students is for three academic quarters, although those who are required to participate in a cooperative work assignment may apply on a term-by-term basis.

The Selection

The choice of housing is an important consideration for the first year, and freshmen are encouraged to visit Northeastern before making a decision. Tours of residence halls are available by advance arrangement with the Department of Admissions.

Upperclass and transfer students may live in residence halls or apartments. Freshmen are usually assigned to residence halls unless available space exists only in apartments.

Most rooms are designed to accommodate two students; however, some three- and four-person rooms are available in certain of these facilities. Some residence halls feature "group areas" that house from three to six students in a two- or three-room area.

The University maintains some apartment units for men and women. These apartments accommodate up to four students. Assignments are made, based on the date of receipt of the housing deposit and application. Each unit is fully furnished, and the rental charge includes utilities.

Off-Campus Housing

Arrangements for off-campus housing are the responsibility of the student and the student's family. Though the Housing Office, 104-106 Ell, has agreed to make a listing of off-campus housing available, **we do not inspect or endorse the advertised property or space.**

Fraternity Housing

Certain fraternities provide opportunities for room and board for men at reasonable rates. Information regarding these housing facilities may be obtained from the Housing Office, 104-106 Ell, Northeastern University, Boston, Massachusetts 02115.

Cars

Freshmen living in residence halls are not allowed to have cars or other powered vehicles on campus.

Upperclass students are strongly discouraged from bringing cars with them, as the University does not permit overnight parking, and there is a severe shortage of public parking spaces near the University.

Costs for Room and Board Per Quarter*

Women's Residence Halls

Kerr Hall (upperclass students only)	\$1200.00
157-163 Hemenway	\$1310.00

Coed Residence Halls

Smith Hall (upperclass students only)	\$1200.00
Speare Hall	\$1310.00
Stetson Hall West	\$1310.00
Stetson Hall East	\$1310.00
White Hall	\$1200.00
YMCA (includes cost of single room)	\$1225.00
153 Hemenway Street	\$1310.00
115 Hemenway Street	\$1310.00
119 Hemenway Street	\$1310.00

Men's Residence Halls

Melvin Hall	\$1200.00
Light Hall	\$1200.00

Apartments (Costs do not include Food Card)

106–122 St. Stephen Street	\$775.00
Fairwood Realty—Huntington Avenue	\$710.00
Museum Villa—454, 458, 460 Huntington Avenue, \$710.00 and 407 Huntington Avenue	\$775.00
Rubenstein Hall—464 Huntington Avenue	\$775.00
West Apartments—50 Leon Street	\$835.00
142–148 Hemenway Street	\$775.00

With the exception of the YMCA, all single rooms are charged at an additional rate of \$50. An infirmity fee of \$25 per quarter is charged to resident students.

***Costs and types of residence halls (coed, men, women) are subject to change.**

Security

Security for the residence halls is provided by trained University police officers. In addition, residents are required to show appropriate identification to the security proctor when entering the residence hall. Guests, both male and female, must sign in with the proctor.

The University police provide escort service for students who wish to go from one section of the campus to another late at night.

University Food Service

The University food plan provides for twenty-one meals per week, and all students who live in University residence halls **are required to participate**. The cost of a food card for those living in an apartment and choosing the food plan is \$600 per quarter. When conditions warrant, such as during weekends and slow periods, the University may close or consolidate certain dining facilities.

Student Activities

The University regards student activities as an integral part of education and provides for a range of activities to arouse your interests and satisfy your inclinations: you are given the opportunity to play intramural sports on a wide variety of teams; write for the *Northeastern News*; broadcast over the student-operated radio station; act, dance, sing, play music; or become involved with student government.

The University encourages relaxation and socializing: you can listen to live music in the Rathskeller, meet new friends, attend a lecture, a film, or a play, or go skiing or camping in the mountains. Once you begin to take advantage of what is available on campus, there's no telling what you will learn or whom you might meet.

If you are a commuter student, it is likely that a good portion of your between-class time will be spent in the Carl S. Ell Student Center. The dominant feature of the main level of this "student building" is the magnificent main lounge. Five stories in height, the lounge will comfortably seat 800 students—a good place for quiet conversation or contemplation. Below the lounge are a cafeteria and the Rathskeller, where the sounds are much more audible. In addition, the Center has a ballroom, music practice rooms, a large gameroom with billiards and table tennis equipment, study space, a typing room, and many meeting and function rooms. The Information Booth staff can help with any questions and also offers printing and photocopying services. The Student Center is that part of Northeastern University where you can relax and really feel comfortable and at home.

Each Monday and Thursday, the hours between 11:30 a.m. and 1:30 p.m. are reserved for student activities. No classes are held during these times, to allow students an uninterrupted period of time for themselves. Student clubs, intramural sports, cultural events, and many other activities are scheduled to provide opportunities to make spontaneous or planned use of your time. You have the chance to become involved in campus activities, whether you reside in the residence halls or are a commuter, without interfering with your academic commitments.

Student Organizations

All-University Activities

- NU Freshman Orientation Staff
- Programming Organizations
 - Council of Alternative Programs
 - Rathskeller Committee
 - Social Council
 - Concert Committee
 - Film Committee
 - Lecture Committee
 - Publicity Committee
 - Special Events Committee
- Student Alumni Association
- Student Government Association
 - Student Affairs Committee
 - Student Center Committee
 - Student Court
- Student Union
 - Unicom

Artistic and Musical Organizations

- Band
- Choral Society
- Dance Theatre
- Early Music Players
- Jazz Society
- Modern Dance Club
- Orchestra
- Silver Masque

Departmental and Academic Organizations

Accounting Society
American Society of Personnel Administrators
Association for Computing Machinery
Beta Biological Society
Black Business Student Association
Black Engineering Student Society
Business Student Advisory Committee
Coalition for the Preservation of African-American Studies
Computer League and Educational Users Society
Co-op Student Advisory Committee
Criminal Justice Advisory Council
Criminal Justice Student Security Organization
Economics Club
English Club
Evening Student Council
Financial Management Association
Human Resource Management Club
Human Services Student Organization
International Business Association
Marketing Club
MBA Women of Northeastern
Medical Laboratory Science Club
Physical Education Majors Club
Physical Therapy Yearbook
Physics Club
Political Science Student Advisory Committee
Recreation Majors Club
Respiratory Therapy Club
The Script (Physical Therapy Yearbook)
Society for the Advancement of Communication Studies
Sociology/Anthropology Students Association
Speech and Hearing Club
Student Athletic Trainers Association
Student-Faculty Biology Relations Committee
Student Health Records Association
Student Industrial Security Association
Student Nurses Association
Toxicology Student Association

Political and Social Action Organizations

Committee in Solidarity with the People of El Salvador
Pro-Choice
Students for Environmental Awareness
Students for Safe Energy
Young Democrats
Young Republicans

Media

Cauldron
Northeastern News
Onyx
Spectrum
WRBB-FM



Special Interest Clubs

Amateur Radio Club
Association of the U.S. Army
Cheerleaders
Chess Club
Disabled Students Organization
Downhill Skiers
Dragon Karate Club
Flying Club
Groove Phi Groove Social Fellowship
Hus-Skiers and Outing Club (NUHOC)
Juggling Club
Karate Club
Lambda: Gay Students Organization
Model Railroad Club
Pershing Rifles
Photography Club
Sailing Club
Scabbard and Blade
Semper Fidelis (Marines) Club
Shotokan Karate Club
Sport Parachute Club
Tactical Society
Terra Society
Underwater Society
Women's Center

Religious Organizations

Bahai'
Chi Alpha Christian Fellowship
Christian Fellowship
Christian Science Organization
Christian Student Association
Fellowship of Christian Athletes
Hillel
Islamic Society
Maranatha Ministries
Navigators
Newman Club
Nichiren Shoshu of America
Phanar Orthodox Society
Seekers Christian Fellowship

Ethnic and Cultural Clubs

Arab Heritage Cultural Club
Armenian Club
Chinese Student Club
Confederation of Iranian Students
Federation of Nigerian Students
Haitian Student Unity
Hellenic Club
International Students Forum
Iranian Student Organization
Irish Club
Latin-American Student Union



Lebanese Student Association
National Black Student Association
Organization of Arabic Students
Persian Student Society

Professional Societies

Public Relations Student Society

New Horizons

This program, sponsored by the Student Activities Department, is designed to provide enjoyment as well as the opportunity to engage in a unique learning experience.

The series of noncredit mini-courses is conducted by qualified persons in special areas of interest. There are no grades, no transcripts, and no examinations. In a few courses, textbooks are required; in areas such as the performing arts, contemporary issues, crafts, or media, a material fee may be required.

Enrollment in courses is determined on a priority basis with first opportunities for registration to full-time undergraduate and graduate students, and on a space-available basis to other members of the Northeastern community.

Course enrollment is limited by the nature of the subject matter and the size of the facility. Registration is on a first-come, first-served basis.

For questions, brochures, or applications to teach a free mini-course, call or visit the Office of Student Activities, Room 255 Ell Center; telephone: 617-437-2634.

Fraternities

Alpha Epsilon Pi

6—8 Capen St.
Medford, MA 02155
396-1177

Alpha Kappa Sigma

29 Greenough Ave.
Jamaica Plain, MA 02130
524-9869

Beta Gamma Epsilon

234 Commonwealth Ave.
Boston, MA 02116
262-1639

Iota Phi Theta

255 Ell Center

Gamma Phi Kappa

11 Vancouver St.
Boston, MA 02115
427-8774

Kappa Alpha Psi

255 Ell Center

Nu Epsilon Zeta

255 St. Paul St.
Brookline, MA 02146
566-9804

Phi Beta Alpha

255 Ell Center

Phi Gamma Pi

241 Kent St.
Brookline, MA 02146
566-8970

Phi Sigma Kappa

37 Greenough Ave.
Jamaica Plain, MA 02130
524-9893

Tau Kappa Epsilon

30 Mansfield St.
Allston, MA 02134
254-3431

Zeta Beta Tau

42 Chestnut Square
Jamaica Plain, MA 02130
522-5162

Sororities

The two recognized sororities and three colonies for women also play an important role in the extracurricular life of the University. Although none has a separate house, they can all be reached through the Office of Student Activities, Room 255 EC, or the Intersorority Council adviser in the Dean of Students' Office, 203 EL, at the University. The names of the sororities follow:

Alpha Kappa Alpha
Delta Phi Epsilon
Delta Sigma Theta
Sigma Delta Epsilon
Zeta Phi Beta

Sports

The University provides opportunities for all students to participate in athletic programs that correspond to the abilities and inclinations of most students. We especially wish to provide each of you with a chance to develop skills and competence for lifelong athletic pursuits. Along with many casual, drop-in opportunities are chances for all to participate as members of intramural teams. Examples of intramural sports include touch football, basketball, volleyball, soccer, ice hockey, wrestling, softball, and track.

Professional Societies

Students will benefit in many ways by joining the student chapter of a professional society in an area of study of particular interest to them. They have the opportunity to keep up with latest developments by listening to authorities in that field, to exchange ideas with students from other colleges and universities as well as from Northeastern, and to learn more about professional standards.

If students take an active part by attending regular meetings and social affairs, they may become officers or members of a delegation to meetings outside the University. Such participation may prove invaluable in shaping a career.

The following professional societies, the majority of which are national organizations, are open to upperclassmen in their respective professional fields:

American Chemical Society
American Institute of Chemical Engineers
American Institute of Industrial Engineers
American Society of Civil Engineers
American Society of Mechanical Engineers
Engineers Council
Institute of Electrical and Electronic Engineers
National Student Nurses Association
Sigma Delta Chi (Journalism)
Society of Women Engineers
Society of Women in Business
Student American Pharmaceutical Association

Photo-Identification Operation

All full-time students, staff, and faculty are required to have an officially approved and properly validated photo-identification card. All students are required to show the card at the Library, athletic events, student elections, Health Services, and the Bursar's or Registrar's Office.

An official I.D. card will be issued to new students at their orientation and registration periods. Replacements for lost cards can be obtained by going FIRST to the Bursar's Office, 248 RI, and then, for the photo, to 251 Ell Center between the hours 11:30 a.m.–2:30 p.m., Monday through Friday. A charge of \$2 is levied for the initial I.D. card; \$5 for a replacement.

Religious Life

Northeastern has genuine concern for the religious and moral development of students of all faiths. A Religious Advisory Board, consisting of administrators and faculty, as well as the full-time guest chaplains, seeks to articulate the needs in this area and facilitate the work of various religious groups on campus. A Chaplains' Association, consisting of the full-time guest chaplains, works cooperatively to emphasize the interfaith dimensions of campus life.

The chaplains also deal with students on a denominational basis at various centers near the campus: Episcopal College Work Center in Brookline; Hillel House on Parker Street; Lutheran Center, 84 The Fenway; and St. Ann's Roman Catholic Parish on St. Stephen Street. In addition, there are numerous religious student organizations on campus, recognized by the Student Affairs Committee and listed under "Student Organizations."

Interfaith chapel services are held in the Bacon Memorial Chapel, located in the Ell Student Center. These voluntary religious services are planned to commemorate special days and events and will be announced sufficiently ahead of time. The Chapel is also used for denominational worship services and special lectures on religion. It is open daily for prayer and meditation and is a frequent setting for weddings of students and alumni.

Men's Athletics

Whether it be on the superturf of Parsons Field in the fall, the ice or hardwood of the Matthews Arena in the winter, or the waters of the picturesque Charles River in the spring, a Northeastern athletic team is always competing somewhere.

And that somewhere is also, at times, Henley on the Thames, England; San Diego; Madison Square Garden, New York; and Fenway Park, Boston. In fact, you could include Montreal in the summer of '76 when three Northeastern alumni (more than any other New England college) were members of the United States Olympic team, with one alumnus winning a silver medal.

All students are urged to participate in the University's athletic program, which includes all major collegiate sports. The University maintains varsity teams in baseball, crew, swimming, cross-country, track, football, hockey, basketball, and golf. These teams are among the finest in the East and have represented the University in both national and international competition. Students may also participate in such sports as sailing, water polo, volleyball, lacrosse, soccer, gymnastics, softball, handball, and fencing.

Facilities include the spacious Cabot Physical Education Center, Edward S. Parsons Field, and the refurbished Matthews Arena. The Cabot Gymnasium contains four basketball courts, one gymnastics court, and a cage for indoor track as well as baseball and football drills. Parsons Field is the location of the Huskies' football stadium, with its new artificial surface, and of the Northeastern baseball diamond. It also accommodates training areas for the outdoor track team. The Northeastern crew enjoys a spacious boathouse on the Charles River and also works out in the Cabot complex, where rowing tanks are located.

The hockey and basketball teams make their homes in the historic "Boston Arena," now the Matthews Arena since its purchase by the University in 1979. The Arena is located just a slapshot away from the main quadrangle of the campus and, in addition to ice, of course, offers the Husky hoopsters a portable floor on which to play.

The oldest indoor hockey rink in the world, the Matthews Arena features a seating capacity of some 7,000 and the finest sight lines of any arena in the nation. This past winter, the Matthews Arena served as a veritable turnstile of thrills, as the hockey and basketball teams traded turns establishing milestones on their respective surfaces.

With record crowds jamming the sparkling facility, the hockey team responded with a historic twenty-five-win season that included, among many precedents, a 1982 ECAC Championship and a third place in the NCAA Tournament.

When the ice was hidden under the portable floor, the basketball team obliged with a brilliant 23-7 season, a second-straight ECAC North title that it defended at the Arena, and a second-straight trip to the NCAA tournament field, in which the hoop Huskies advanced to the second round.

Northeastern annually fields one of the most competitive football teams in New England, as a Division IAA independent. In their forty-seven year history of football, the Huskies have enjoyed three undefeated seasons and, in 1963, went to play in the Eastern Bowl. Northeastern always plays a demanding schedule, including in recent years such opponents as Harvard, Holy Cross, Colgate, UMass, Lehigh, New Hampshire, and Rhode Island.

The University's hockey team traditionally is one of the strongest in the East. It is ranked annually in the top ten in the East and has competed in several Eastern College Athletic Conference Championships. The Husky icemen have won the ECAC Holiday Hockey Tournament in Madison Square Garden, the RPI Invitational, and the Yale Holiday Festival. Each February, Northeastern plays in the prestigious Beanpot Tournament before standing-room-only crowds at the Boston Garden. In fact, the team won the annual battle of the Boston colleges (Harvard, Boston College, and Boston University) in 1979-80, making NU the first New England college to win both the men's and women's Beanpots in the same year.

The basketball team wages its roundball wars in the tough, Division I ECAC North Atlantic conference of the NCAA. It plays local powers such as Boston College, Holy Cross, and Boston University and is constantly flying out to challenge some of the nation's best, including Princeton, Georgia, Southern Mississippi, University of Pennsylvania, and Syracuse. Even against the best in the East, Northeastern has sixteen winning seasons in the last twenty years and for the last two years earned a berth in the NCAA Championships as the ECAC North Champion.

To talk about track and cross country in New England is to talk about Northeastern track. Northeastern has dominated the New England track and field scene for the past ten years. In that stretch, Northeastern has captured six New England indoor titles and NCAA Championships and has many alumni running for national and international honors as members of top track clubs.

Northeastern also fields a strong team in golf and competes in all the major eastern championships.

The most amazing Husky sports story is that of crew. In 1965, its first season, the NU crew won four of five regattas and the small college rowing championships and became the first NU team to participate in international competition when it rowed in the Henley Royal Regatta. The next year, the Huskies moved into the major college rowing league. They culminated their swift rise by winning the Eastern Sprints in 1972 and 1973 and rowed in the finals of the Grand Challenge Cup of the Henley Royal Regatta. In 1973, they were considered the finest eight in the nation. In 1978, the freshman crew won the Eastern Sprints and was invited to row the Thames Challenge Cup race at Henley. In 1979, the junior varsity crew won the I.R.A. Championship.

The University has buttressed its physical fitness facilities campus-wide and now accommodates the daily influx of undergraduates, graduate students, staff, and faculty at Cabot Gymnasium and the Matthews Arena. One of the most popular accoutrements in the Cabot Gymnasium is the four-year-old Nautilus weight-training room, equipped with revolutionary Nautilus apparatus and traditional free weights. Four racquetball courts are also available to students, athletes, faculty, or staff members. Daily ice time is set aside at the Matthews Arena for the University community and the public, as well.

Women's Athletics

From a very small program with very few resources, the Northeastern University women's intercollegiate athletic program has grown rapidly in the past several years, reflecting the tremendous growth in women's athletics at all levels. The program now encompasses twelve activities: basketball, crew, cross-country, field hockey, gymnastics, ice hockey, lacrosse, swimming and diving, tennis, track and field (indoor and outdoor), and volleyball.

As members of the NCAA, Northeastern University subscribes to all policies and regulations of the Association. Athletic scholarships are available to women student athletes in all programs.

Northeastern's goal is to provide an excellent program of intercollegiate athletics for all women students who qualify. Our programs are in the mainstream of the exciting growth in women's athletics throughout the country.

The field hockey and lacrosse teams, using the astroturf at Edward S. Parson's Field in Brookline as their home field, have long been regarded as among the strongest in New England. Our basketball and volleyball programs, working out of Dockser Hall and Cabot Gymnasium on the Boston campus, have appeared in state and regional championships. The tennis team, with recent steady improvement, is well respected in the region. Our gymnastics team, with a vastly upgraded schedule, is striving to reach a high level of regionally competitive scoring.

Two of our younger programs—crew and swimming and diving—have shown rapid improvement. Several swimmers and divers have qualified for national championship for the past several years, and members of our crew have been selected for participation in Olympic Development Camps and have been gold medal winners at the National Sports Festival.

Our three newest teams—cross-country, ice hockey, and track and field—are entering their third year with varsity status. The ice hockey team, which makes its home in the beautifully renovated Matthews Arena, is rapidly becoming one of the strongest teams in the East, while our track and field continues its development.

We are moving toward excellence in all programs and, as usual, look forward to an exciting year.

Freshman Orientation Programs

Except for the visits which we hope students will make to the Admissions Office, the first opportunity to learn about Northeastern and to meet classmates, deans, and advisers will come during the freshman orientation period.

The program for orientation is planned and supervised by the Director of Orientation who will see to it that students are introduced to the customs and people that make up Northeastern. At that time, registration, class schedules, and other procedures and details necessary for enrollment will be completed.

During the orientation period, in accordance with a long-standing tradition, students will be welcomed by the President at a special convocation. They also will be able to meet with deans and others who will have important roles in their college careers.

Upperclass students generously volunteer their time to assist in setting up and running programs, primarily evening events, that provide opportunities for relaxation, recreation, and cultural enrichment. The Office of the Dean of Students is available during the orientation period and throughout the year to answer questions and provide assistance. The Freshman Affairs unit of that office has special responsibility for monitoring the academic progress of all freshmen and for assisting them in a variety of ways to attain sophomore status.

Part Four

General Information



General Information

History

Founded in 1898, Northeastern University is incorporated as a privately endowed nonsectarian institution of higher learning under the General Laws of Massachusetts. By special enactment, the state legislature has given the University general degree-granting powers. The University is governed by a Board of Trustees who are elected by and from the Northeastern University Corporation, which is composed of almost 200 distinguished business and professional men and women.

From its beginning, Northeastern University's dominant purpose has been the discovery of community educational needs and distinctive and serviceable ways of meeting them. The University has not duplicated the programs of other institutions, but has sought to pioneer new areas of educational service.

A distinctive feature of Northeastern University is its Cooperative Plan, initiated by the College of Engineering in 1909 and subsequently adopted by the Colleges of Business Administration (1922), Arts and Sciences (1935), Education (1953), Pharmacy (1962), Nursing (1964), Boston-Bouv  College (1964), the College of Criminal Justice (1967), Lincoln College's daytime Bachelor of Engineering Technology Program (1971), and by University College in a special pilot program (1980). This educational method offers students the opportunity to gain valuable practical experience as an integral part of their college programs and also provides the means by which they may contribute substantially to the financing of their education. The plan has been extended to the graduate level in criminal justice, engineering, rehabilitation administration, professional accounting, business administration, and law.

In the field of adult education, the University offers graduate and undergraduate degree programs and noncredit programs that are specifically designed to meet the needs and interests of adults who wish to further their education on a part-time basis.

All formal courses of study leading to degrees in the Graduate Division, Lincoln College, and University College are approved by the undergraduate faculties concerned and are governed by the same qualitative and quantitative standards as the regular day curricula. Courses are scheduled in the day and evening at the Boston Campus, Suburban Campus in Burlington, and at other off-campus locations near Boston.

Policy on Changes of Program

The University reserves the right to withdraw, modify, augment, or change the order or content of courses in any curriculum.

It further reserves the right to change tuition, and fees charged, and other regulations.

Any changes which may be made from time to time pursuant to the above policy shall be applicable to all students in the school, college, or department concerned, including former students who may re-enroll.

Textbooks and Supplies

The Northeastern University Bookstore, located on the ground floor of the Ell Student Center, is a department of the University and is operated for the convenience of the student body. All books and supplies that are required by the students for their work in the University may be purchased at the Bookstore.

The Academic Year

Northeastern University operates on a quarter-system calendar.

Quarter-Hour Credits

All courses are evaluated in terms of quarter-hour credit. A quarter-hour credit is equal to three-fourths of a semester-hour credit.

Grades and Examinations

Examinations covering the work of the quarter usually are held at the close of each quarter. Exceptions may be made in certain courses where, in the opinion of the instructor and with the approval of the dean of the college concerned, final examinations are not necessary.

Pass-Fail System

Students may register for a limited number of courses on a pass-fail basis. Each college has its own rules governing this system. Common to all colleges, however, is the grading system. Pass-fail grades are not included in the calculation of the quality point average. Only pass grades earn credits toward degree requirements. (Pass-fail guidelines are also stated in the *Student Handbook*.)

Grades

A student's grade is officially recorded by letter. Introduced in September 1980, the following grades, listed below with their numerical equivalents, are in effect:

A	4.000
A–	3.667
B+	3.333
B	3.000
B–	2.667
C+	2.333
C	2.000
C–	1.667
D+	1.333
D	1.000
D–	.667
F	0

A general average of C– is not acceptable and will not allow a student to continue at Northeastern University.

Freshman students who are taking a full academic program and who have a weighted average for the year below 1.4 will not be permitted to register for advanced work. Upperclass students should consult the *Student Handbook* to ascertain the level of continuing achievement required of them by the faculty of their college.

An I, or X (Incomplete), grade is used to show that the student has not completed the course requirements.

An official University grade report is mailed to each student at the end of each quarter.

Transcripts

Applications for transcripts of record are made at the Registrar's Office (120 HA). A charge of \$2.00 is made for each transcript request.

Dean's List

An Honors or Dean's List is issued at the end of each quarter. The list contains the names of students who have a 3.0 weighted average or higher, with no I grade or grade below C-. Students who are on any form of probation, enrolled in courses on a pass-fail basis (except where there is no alternative or where required by the program), or who are not carrying full loads as determined by their basic college will not be eligible. With few exceptions, as approved by the respective Colleges, a full load is normally considered to be four courses or sixteen quarter hours.

Dean's List with Honor	3.000–3.490
Dean's List with High Honor	3.500–3.740
Dean's List with Highest Honor	3.750–4.000

Reports on Scholastic Standing

Reports for all students are issued at the end of each grading period. Questions about grades are to be discussed with the student's faculty adviser.

At the end of the academic year, juniors will receive, in addition to their term reports, a complete cumulative copy of their permanent records so that they may be aware of any discrepancies in their records and, if so, should contact the dean of their college.

Students are constantly encouraged to maintain an acceptable quality of college work. Parents and students are always welcomed by the college officers and faculty advisers for conference upon such matters.

Family Educational Rights and Privacy Act

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records wherever appropriate and to challenge specific parts of them when they feel it necessary to do so. Specific details of the law as it applies to Northeastern are printed in the *Student Handbook*, which is distributed annually at registrations.

It is the policy of Northeastern University to deal with the student in all academic and administrative matters. If parents require any information regarding the progress of their son or daughter, they may contact the Dean of Students' Office.

General Conduct

It is assumed that students come to the University for a serious purpose and that they will conform to such regulations as may from time to time be made. The University community expects each student to respect the rights and privileges of others and to adhere to acceptable standards of personal conduct. Students should exercise their freedom with maturity and responsibility. They are expected to obey University regulations and follow the instructions of and pay due respect to University officials. Conduct inconsistent with the general order of the University may result in disciplinary action. Damage to any building or to any of the furniture, apparatus, or other property of the University will be charged to the student or students known to be immediately involved.

The University seeks to administer discipline with a high standard of integrity and a scrupulous regard for truth. Any student's attempt to present any work not his or her own or to pass any examination by improper means is regarded as a most serious offense and renders the offender liable to disciplinary action. Aiding and abetting a student in any dishonesty is also held to be a grave breach of discipline.

Attendance

Students are expected to attend all meetings of their classes. Absence from regularly scheduled classes may seriously affect the standing of the student and result in the University's dropping the subject or subjects from his or her schedule. Laboratory work can be made up only during hours of regularly scheduled instruction.

Emergency Closing of the University

Students, faculty, and staff are notified by radio when it becomes necessary to cancel classes because of extremely inclement weather. Radio stations WRBB, WRKO, WBZ, WEEI, WHDH, WCOZ-FM, WFNX-FM, WKOX, WVBF-FM, WBCN-FM, WHUE, WHAV, WLLH, WNTN, WCAS, WBOS, WXKS, WROR, WILD, WMER, WTPP, and WJDA will announce the University's decision to close.

ROTC

Military Officers Education Program

Army

Richard A. James, LTC, U.S.A.; M.A., *Professor and Chairman*

General Objectives

The Department of Military Science administers Northeastern's ROTC Program. Regarded by the University as an integral part of its education program, ROTC is available on a voluntary basis to all full-time students. The program's mission is to develop officers—leaders. It offers courses of instruction designed to lead to a commission as an Army second lieutenant.

The ROTC staff consists of active Army officers and NCOs, assigned by the Department of the Army.

Courses of Study

The program consists of the Basic Course (freshman and sophomore years) and the Advanced Course (middler, junior, and senior years) and complements the co-op program by tailoring the courses to the student's schedule.

Enrollment in the Basic Course is voluntary and is open to all full-time students who qualify. Students do not incur a military obligation by participating in the Basic Course.

The Advanced Course is open to all qualified students who meet these prerequisites: (1) completion of Basic Course or approved equivalent, or prior honorable military service; (2) physical aptitude and medical requirements; and (3) age requirements. Students accepted for the Advanced Course execute a written contract that obligates the newly commissioned second lieutenant to a period of military service. Advanced Course students receive a \$100/month stipend (\$2,000 total). They are also paid for the six-week advanced camp normally attended during their junior and senior year.

ROTC Scholarships

The Army ROTC scholarship provides full tuition, fees, textbooks, and \$100 per month to the recipient. Scholarships are available in varying lengths and cover the cadet's remaining academic years. *Noncadets* may apply for scholarships covering their last four or three academic years. These scholarships are merit-based scholarships, and a student's earnings during cooperative work periods do not reduce scholarship payments.

Veterans and Transfer Students

Honorably discharged veterans (enlisted) are a vital part of our cadet corps and will receive special consideration for ROTC entry.

Transfer students, whether or not previously enrolled in ROTC, are also welcome to join our program. They should contact the Department of Military Science concerning their options for program entry.

Uniforms and Equipment

Uniforms are issued without cost to ROTC cadets. A \$35 deposit is required to ensure the return of the loaned property in good condition. Loss or damage to Army equipment, exceeding the deposit, will be charged to the student.

Academic Credits

Regulations of the individual Basic Colleges prevail for ROTC graduation credit. However, students may petition individually their academic department for acceptance of certain courses for graduation credit.

Air Force

John A. Lukasik, Lt. Col., USAF; M.S.

Professor and Chairman, Department of Aerospace Studies, B.U.

The Air Force Reserve Officer Training Corps (AFROTC) program offers students an opportunity to earn a commission in the United States Air Force. The student is commissioned as a second lieutenant upon completion of both the Aerospace Studies (AS) curriculum and the requirements for an undergraduate or graduate degree. Northeastern University students may enter the AFROTC program as members of either a four-year or a two-year program. Participation in AFROTC by nonscholarship students during the first two years of the four-year program carries no commitment to serve in the Air Force.

The entire AFROTC program at Northeastern is administered by AFROTC Detachment 355, 156 Bay State Road, at Boston University (tel. 353-4705). The AS 100 (freshman) and AS 200 (sophomore) classes are held on the Northeastern campus. All other AFROTC classes are conducted at the BU campus.

Four-Year Program Undergraduates may join the four-year AFROTC program by registering for the appropriate Aerospace Studies classes. Students from all academic disciplines, including five-year co-op programs, may register. The preferred point of entry is the first semester of the freshman year, although students may enter as late as the first semester of the sophomore year.

Freshman classes focus on the functions, organizations, and hardware of the Air Force. Sophomore classes concentrate on the history of aerospace power. Complementing the academic classes is a weekly leadership laboratory, during which students are introduced to Air Force customs, courtesies, drill, ceremonies, and lifestyles.

The Air Force uniform and AFROTC books are provided to the student free of charge except for a refundable uniform deposit.

Continuation beyond the sophomore year is competitive and is not guaranteed. Factors considered include leadership potential, academic performance, field training evaluations, and results of a physical examination.

The non-flying commissioned graduate incurs a four-year active duty service commitment. Navigators incur a five-year, post-training commitment, and pilots incur a six-year post-training commitment.

Two-Year Program Students unable to participate in the four-year AFROTC program are eligible for the two-year program. Prerequisites for entry into the two-year program include (1) at least six remaining academic quarters of undergraduate or graduate study; (2) meeting Air Force physical standards; (3) good moral character; and (4) successful completion of six weeks of field training. Applications for the two-year program require several months for processing. Prospective two-year program members should contact the University AFROTC detachment at least six months prior to proposed entry.

Scholarships Academic scholarships are available for those who qualify. The College Scholarship Program pays for tuition, textbooks, required fees, and a \$100-per-month, tax-free subsistence allowance. Most scholarships are awarded for four years starting with the freshman year. Application is made while the student is a senior in high school. Application forms should be available in the guidance counselor's office or can be obtained by writing to the Four-Year Scholarship Branch, Air Force ROTC, Maxwell AFB, AL 36112. Scholarships are also available for students already in college. Students may apply for a three-and-a-half, three, two-and-a-half, or two-year scholarship. Call 353-4705 for further details.

Division of Cooperative Education

Cooperative education is a dynamic system of education based on the principle that students develop most effectively through an educational program that provides for periodic exposure to the world that exists beyond the campus. Through controlled and structured experiences, students bring an enrichment to the classroom that enhances their total development. The essential factors are that satisfactory participation in cooperative education is considered a degree requirement and that the educational institution assumes the responsibility for integrating these experiences into the education process. It is called "cooperative education" because it is dependent upon the cooperation of outside agencies, educators, and students to produce an integrated program.

Studies have shown that the reinforcement of classroom learning by job responsibilities increases a student's motivation and self-confidence. Greater interest in academic work develops when the student sees the relation between job responsibilities and principles studied on campus. These experiences can also help to instill a sense of identity and worth as the student functions as an adult in an adult world.

Northeastern's commitment to cooperative education is illustrated by the diverse but related activities of the four departments within the Division of Cooperative Education. Each department makes a unique contribution to the development of cooperative education and the enhancement of its effect on Northeastern's students.

The Department of Cooperative Education

Paul M. Pratt, M.Ed., *Dean*

Richard E. Sprague, M.B.A., M.Ed., C.A.G.S., *Assistant Dean*

Kathy Sharkey-Jordan, M.Ed., *Assistant to the Dean*

Professors

Nancy J. Caruso, M.Ed.

Charles F. Field, M.Ed.

George K. Howe, M.Ed.

Robert W. Miller, M.Ed.

Judith A. Moll, M.S.

Anthony R. Rotondi, M.Ed.

Willie Smith, Jr., M.Ed.

Roderic W. Sommers, M.Ed.

Hugh J. Talbot, M.P.A.

Associate Professors

Boreslaw P. Berestecky, M.Ed.

Betsey W. Blackmer, M.Ed.

Richard L. Canale, M.Ed.,

C.A.G.S.

Elizabeth A. Chilvers, M.Ed.

Mark I. Conley, Jr., Ed.D.

Robert D. Deforge, M.Ed.

Rosemarie DiMarco, M.S.

Philip W. Dunphy, M.Ed.

Mary R. Flynn, M.Ed.

Kenneth R. Hancock, Jr., B.S.

Stephen M. Kane, Ed.D.

Gerard J. Lavoie, M.P.A.

Homer C. Littlefield, B.S.

Assistant Professors

Michael A. Ablove, M.Ed.

Robert S. Brown, M.B.A.

Donald L. Eastridge, M.Div.

Jean F. Egan, M.Ed.

Kathleen L. Finn, M.Ed.

John C. Mulhall, M.S.

Melvin W. Simms, Ed.D.

William A. Sloane, M.B.A.

Robert T. Tillman, M.Ed.

Patrick F. Todd, B.S.

Instructors

Veronica M. Leona, M.Ed.

Peter J. Mollo, M.Ed.

The largest department in the Division, the Department of Cooperative Education is responsible for the administration of the cooperative education program for undergraduate and graduate students at Northeastern. Details on the specifics of operation are explained on page 30 of this catalog and in a booklet entitled *Co-opportunities*, which is available on request from the Department of Admissions.

Life/Career Planning Program

Joseph E. Barbeau, M.Ed., Ed.D., *Acting Director*

The fundamental mission of the Life/Career Planning Program is to offer students a variety of career-related services. Those who may be undecided about their academic major or career direction or who want to explore career options and formulate postgraduation plans may elect any of several courses which are open to all undergraduate majors. In some cases, students are required by their major departments to take a Life/Career Planning course during their freshman year. Students needing assistance in designing or revising their personal résumé may attend a regularly scheduled résumé workshop or may use the drop-in service of the Career Resource Center. Also available in the Center is an open-shelf collection of print materials and a computer terminal for obtaining information on jobs and careers, local and regional industries, and graduate and professional schools.

International Cooperative Education

Robert E. Vozzella, M.A., C.A.G.S., *Director*

Northeastern University carries its unique program in cooperative education to the international scene by offering its students the opportunity to be placed abroad for their cooperative work experience. Exchange Co-op programs are operated with a number of foreign institutions and agencies. Placements are available in Germany, France, the United Kingdom, Ireland, Sweden, Canada, and Israel for students whose linguistic, academic, and professional experience makes them competent candidates for positions abroad.

The International Cooperative Education Office provides a wide variety of services for International students on matters relating to their co-op employment, such as social security and tax information. A course entitled Working in the United States is also available to International students through the auspices of this office and is designed to assist them in competing more effectively for cooperative education positions.

The Center for Cooperative Education

Paul E. Dubé, M.A., M.Ed., *Director*

Educational institutions and other organizations exploring, developing, expanding, or improving programs in cooperative education contact the Center for a variety of services. All facets of the establishment, operation, and expansion of programs may be explored with professional consultants familiar with all aspects of cooperative education. In addition to providing technical assistance, the Center will conduct evaluations of cooperative education programs for both educational institutions and employers.

Intensive, short-term training workshops for both new and experienced coordinators of cooperative programs and the four-week Summer Institute in Cooperative Education offering eight quarter hours of graduate credit are among the other services offered by the Center.

The International Secretariat was organized to continue the efforts begun at The Second World Conference on Cooperative Education, sponsored by Northeastern University in April 1981. The Secretariat assists business, industry, education, and government in the design and implementation of programs to effectively relate education, training, and work in countries outside of the United States.

The Secretariat, to help Northeastern better serve its international students and the countries from which they originate, is developing a project to coordinate the efforts of the Cooperative Education Department and those of its international student admissions staff. Employment will be sought and international students recruited in those regions of the world in which economies are strong enough to provide at-home placements for the students during their cooperative education employment periods.

The Cooperative Education Research Center

James W. Wilson, Ph.D., *Asa Smallidge Knowles Professor
of Cooperative Education and Director*

Various aspects of the effectiveness of cooperative education are continuously investigated by the staff of the Research Center, and the results are published and disseminated among the cooperative education community. The purpose of these studies is to aid practitioners in the field so that they can be of greater service to students enrolled in cooperative education programs. As a part of its research activity, the Research Center has established an information clearinghouse to store information about cooperative education and make it available to interested people throughout the country. A library of cooperative education and related material is maintained for research and consulting purposes.

Department of Career Development and Placement

Sidney F. Austin, M.Ed., *Dean and Director*

The Department of Career Development and Placement offers a wide range of counseling and placement assistance to all seniors and alumni of Northeastern University seeking employment; to undergraduates seeking admission to graduate schools, including medicine and law; and to students interested in participating in nonpaid, part-time internships in private or public nonprofit agencies for which they may receive academic credit.

Through this department, representatives of hundreds of employers are scheduled to visit the campus each year to interview seniors and graduate students for full-time employment after graduation. A job bank of currently available positions is maintained for alumni who are seeking new opportunities for which they may be qualified. Credential service is provided for students and alumni seeking positions in the field of education and for applicants to graduate and professional schools. Regularly scheduled seminars are conducted for seniors and alumni on career development, job-finding techniques, résumé preparation, and effective interviewing. Individual career counseling is available for seniors and alumni of all University programs.

University Libraries

Roland H. Moody, A.B., B.L.S., *Director*

"All that mankind has done, thought, gained, or been: it is lying as in magic preservation in the pages of books."—Thomas Carlyle

The University libraries endeavor to provide the informational and bibliographic services required by students and scholars working in subject fields covered by University programs of instruction and research. In all, the collections include more than 500,000 cataloged volumes. In addition, the library holds in excess of 500,000 titles on microform, including the comprehensive *Libraries of American Civilization and English Literature*.

The microform collection includes microprint, microfilm, and microfiche with appropriate equipment for reading.

Periodicals (approximately 3,900 titles received currently), government documents relevant to the University, technical reports, pamphlets, and recordings (more than 5,000) enhance the collections. There are duplicating facilities available in all libraries.

Libraries

The Dodge Library houses the main collections, the main bibliographic resources for the library system, the central processing units, and library administration. Its seven air-conditioned reading rooms, many recently renovated, include the Richardson Room; the Reference Room, with a collection in excess of 20,000 volumes including almanacs, atlases, bibliographies, biographical dictionaries, information on business services, dictionaries, directories, encyclopedias, gazetteers, handbooks and manuals, indexes and abstracts, and technical reports; the Periodical Room; the Documents Room; the Microform Room; the Reserve Book Room, with a 20,000-volume collection; and the Fine Arts Room.

Additional libraries include the divisional libraries of Physics/Electrical Engineering, Mathematics/Psychology, and the Hurtig Hall Library (Chemistry, Biology, and Pharmacy)—all graduate-level collections; the Boston-Bouvé College of Human Development Professions Library; and the School of Law Library. The Suburban Campus at Burlington has its own library, and there are also collections at the Marine Science and Maritime Studies Center in Nahant and at the Center for Management Development in Andover.

Services and Hours

A handbook, A-V aids, bibliographic guides, and lectures introduce students to methods of utilizing the resources of the collections, and a dedicated staff is prepared to help users of the various libraries. All members of the University, and others at the discretion of the Librarian, have the use of reference books, government documents, card catalogs, and service. During term time, most libraries are open 7:45 a.m. to 10:00 p.m., Monday through Thursday; 7:45 a.m. to 7:30 p.m. on Friday; 12:00 p.m. to 4:00 p.m., Saturday and Sunday, with certain areas in the Dodge Library open later hours in the evening.

New England Library Information Network

The Northeastern libraries have computerized many operations internally and, in addition, hold membership in the New England Library Information Network. NELINET has been established for the purpose of developing and operating major library support services. It is a network of libraries devoted to sharing financial, human, and material resources to reduce cost and redundancy and to expand the timeliness and variety of services available.

Office of Learning Resources

Mina B. Ghattas, Ph.D., *Director*

The primary mission of the Office of Learning Resources is to help support the instructional and communications needs of the University. The philosophy of the Office of Learning Resources is keyed to that of the University: to provide faculty and students with a comprehensive range of modern and efficient tools for teaching and learning, to support scholarship and inquiry, to communicate effectively, and to be professionally active.

Instructional Development and Evaluation Services Instructional Development and Evaluation Services assists individual faculty with specifying instructional goals, reviewing related literature and materials, examining alternative teaching strategies, producing learning materials, and evaluating course effectiveness. Its training in presentation and teaching techniques is complementary to its basic function of developing instructional units and courses.

Media Production Services Media Production Services coordinates and provides professional consultation and specialized services in graphics, photography, audio recording, television, and multimedia production for various University needs. In a media production laboratory, facilities and assistance are provided for students, faculty, and staff to produce their own materials, such as charts, graphs, illustrations, layouts, overhead transparencies, and photographic slides. Training workshops in media production and utilization may be arranged for organized groups.

Learning Resources Center The Learning Resources Center furnishes students with tutoring services and individualized study facilities in support of regular course requirements as well as supplemental instruction in many subject areas. Study materials here are presented in varied interactive formats, including programmed texts, audiotapes, videotapes, sound filmstrips or slides, computer-assisted lessons and exercises, and related workbooks. One of the major LRC facilities is its language laboratory. A listening lounge, equipped with a stereophonic sound system, supplies a large selection of classical and popular pre-recorded music. A number of terminals that allow users to access the University's central computer are located in the LRC.

A new adjunct facility, the Center for Assessment, Tutoring, and Enrichment Resources (CATER), to supplement certain mathematics courses through a combination of computer-assisted instruction, video technology, and tutoring, is also part of the LRC complex. Students may use LRC facilities independently or to complete class assignments at no cost during day, evening, and weekend hours.

Instructional Materials Services Instructional Materials Services, which acquires and maintains the collection of NU-owned instructional materials, also provides a rental service for 16-mm films and videotapes obtained from outside sources. Faculty who would like to evaluate instructional materials before purchase make use of its preview service. Preview facilities for all types of materials are available for small-group viewing by members of the University community. An up-to-date collection of research reports, periodicals, instructional materials, catalogs, and other reference volumes on all aspects of instructional media and technology is similarly accessible.

Campus Media Services Campus Media Services makes available all types of audiovisual and video equipment and instructional materials for the support of classroom instruction on a prescheduled basis. Items include film, filmstrip, slide, opaque, and overhead projectors, audio and videotape recorders, TV cameras and monitors, portable public address systems, telelecture equipment, record players, and projection screens. This section also distributes instructional materials from the NU-owned collection, such as 16-mm films, videotapes, filmstrips, film loops, slides, and audio cassettes. Certain equipment is reserved for student use, and students may also borrow instructional materials with faculty approval. A catalog of all instructional materials is available at no charge.

University Health Services

Lane Health Center

Job E. Fuchs, M.D., *Director*

A comprehensive program of medical care is provided to all full-time registered students in the Basic Colleges, both graduate and undergraduate. The University maintains a Health Services Clinic in the Forsyth Building, Room 135, which is open for emergencies at all times and is equipped to deal promptly with any medical condition that may arise. All entering students must submit a pre-entrance physical examination form provided by the Lane Health Center prior to registration. Failure to fulfill this requirement can delay registration and result in a penalty fee and an additional fee for a physical examination. Regular clinic hours for the student body are held by staff physicians from 9:00 a.m. to 4:30 p.m., Monday through Friday. Health Services can be reached at all times by telephoning 437-2772.

Specialty clinics in surgery, orthopedic surgery, gynecology, and fertility control and planning are scheduled at specified hours. Please check times with the Health Services office. Pregnancy testing and venereal disease diagnosis and treatment services are always available during clinic hours. Allergy testing and treatment for students with allergic problems are done at the Lane Health Center at no cost except for a nominal fee for the cost of the extracts. Allergic desensitization injections using extract provided by the student's own physician will be given at no cost provided the extract is received in good condition, properly labeled, and with a dosage schedule. Consultation with the various medical and surgical specialists who are not physically present in the clinic will be arranged when deemed necessary by a Health Services physician. The cost of the first visit will be borne by the Health Services.

Special X-ray and laboratory procedures that are unavailable in the Health Services but are deemed necessary by a staff physician will be provided. A full spectrum of mental health services is available. A mental health specialist is present daily, and students are urged to use this service even for minor emotional upsets.

All full-time graduate and undergraduate students are covered by a special Blue Cross and Blue Shield policy, which remains in effect continuously from the day of initial registration until the first of the month following withdrawal, dismissal, or graduation. Married students are urged to go to the Finance Office (249 Richards Hall) to purchase supplementary coverage for dependents.

An infirmary is also maintained in the Forsyth Building for the care of students living in University dormitories and apartment houses. The required infirmary fee entitles students to twenty days' care in the infirmary at no additional charge.

Students are urged to come to the clinic *during regular clinic hours* in order to take advantage of all of our facilities.

Curriculum and Instruction Services

The F. Andre Favat Center The center houses an extensive library of children's literature, books, journals, tests, and other materials designed primarily to support academic programs of Boston-Bouvé College of Human Development Professions, but is open to all University students.

The Reading Clinic The clinic offers a wide range of diagnostic and corrective services for a variety of reading and language problems. It is open to persons of all ages, including University students. With videotaping and viewing facilities, it occupies a suite of fourteen private rooms in Holmes Hall. Faculty members are also qualified to administer such tests as the WAIS, WISC, BINET, ITPA, Bender, and most standardized instruments.

Speed Reading The department offers a noncredit course designed to improve skills in rapid critical and pleasure reading. Offered each academic quarter, the course is available at a reduced tuition rate to students, staff, and alumni of the University.

The Counseling and Testing Center

Philip W. Pendleton, Ph.D., *Director*

The purpose of the Counseling and Testing Center is to offer assistance to students in a wide variety of areas such as career planning, personal and life adjustment problems, study skills, anxiety, choice of major, and interpersonal relationships. At the Center, students are encouraged to discuss their concerns with a counselor, following which they may decide to continue individual counseling, take psychological tests to increase their knowledge of themselves, join a group of students with whom they can share concerns, use self-help tapes, or make use of the Center's extensive file of information about careers and services.

The Center's services are available, without charge, to all students in the Basic Colleges. Students can arrange an appointment by telephoning 617-437-2142 or by visiting the Center in Room 302 E11. Vocational counseling services are also available on a fee basis to high school students and adults.

The counseling services of the Counseling and Testing Center are approved by the International Association of Counseling Services.

Preprofessional Advising

The Pre-Health Professions Advisory Committee, a University-wide group, offers preprofessional counseling for students interested in a career in medicine, dentistry, or related professional medical fields. The Committee members are available to discuss the various medical fields, minimum admissions requirements, and application process.

For students preparing for a career in law, there are also a number of faculty members who can serve as advisers and resource personnel on related curricular and admissions questions.

In addition, the Department of Graduate Placement Services provides information and advice on procedures for admission, preparation of applications, and the scheduling of appropriate admissions tests.

For further information regarding the above, students should contact Ms. Gail Leclerc in 400 Meserve Hall.

International Student Information

The University welcomes qualified students from foreign lands who are adequately prepared to benefit from the educational, cultural, and social opportunities it has to offer. Currently, over 2,100 international students from ninety-five different countries attend Northeastern.

Northeastern University is authorized under federal law to enroll non-immigrant aliens as full-time students in degree-granting programs of its basic undergraduate colleges and graduate schools. Part-time and special students are not included in this authorization.

Because of problems of adjustment experienced by many students from foreign countries, the University makes a special effort to evaluate carefully the educational and financial qualifications of prospective students. The University has an international student adviser and staff to administer to the special needs of these students.

International students who have never attended an institution of higher learning or who have already attended college or a university and want to transfer to Northeastern should write to the Department of Admissions for information and applications. Applicants who have already received a degree or diploma from a university or college and seek information concerning graduate schools at Northeastern should write to the specific graduate school in which they are interested in matriculating.

University admissions policies for international students are found on page 237.

The University does not award financial aid to international students at the undergraduate level.

Office of Multicultural Student Affairs

Roland E. Latham, C.A.G.S., *Dean*

The Office of Multicultural Student Affairs has been created for the purpose of more efficiently meeting needs of Third World students. The Office oversees the coordination and implementation of support services provided by the English Language Center, the International Student Office, and the Office of Minority Student Affairs. Moreover, the Office of Multicultural Student Affairs provides advocacy representation at the upper level of University administration, thereby insuring that Third World student needs are being comprehensively addressed.

The International Student Office

Sally M. Heym, B.A., *Director*

The International Student Office provides a wide variety of services for the more than 2,100 foreign undergraduates, graduates, and faculty at Northeastern. Specific services range from counseling international students regarding immigration regulations and academic, financial, and personal concerns, to issuing forms and official documents which students use to transfer funds from home and travel outside the United States.

The ISO is also a center for international student activities and sponsors such events as ski trips, dinners, tours, picnics, and an International Week in the Spring. It also publishes a quarterly newsletter.

The ISO strives to promote cultural understanding among international students and Americans by presenting cross-cultural communication workshops, orientation programs, and activities. The ISO also acts as a liaison between the various departments and colleges and the many different public and private agencies which have concern for the affairs of foreign nationals in the academic community.



English Language Center

Paul C. Krueger, C.A.G.S., *Director*

Before being considered for admission, students whose native language is not English are required to demonstrate some English language proficiency. This can be done by submitting the results of the College Board's Test of English as a Foreign Language (TOEFL), by successfully completing an approved English language course of study, or by being currently enrolled in such a course.

Before being allowed to enroll in any university classes, all international students, along with any other student whose first language is not English, are required to take the English Proficiency Test administered by the University's English Language Center. This requirement applies to all nonnative speakers regardless of length of time they have been in the United States or their previous study of English.

The results of this test will be used to assign students to their English courses. Students with minimal English language skills will be assigned to the noncredit intensive English course. The level of course work required in English will determine the student's academic schedule.

In addition to serving students, the English Language Center provides advice and consultation to the Northeastern community at large. Center staff are available to answer questions from teachers, administrators, and students and are able to design special programs for special needs at short notice.

For more information about the English Language Center call 617-437-2455.

Office of Minority Student Affairs

Keith Motley, M.S. Ed., *Director*

The Office of Minority Student Affairs was created in 1968, to respond to the special needs of minority students in the Northeastern community. Contact with minority students is established prior to registration, continues throughout the first academic year at Northeastern, and thereafter is maintained and encouraged as long as the student wishes.

The staff of Minority Student Affairs provides assistance and guidance in academic matters such as registration, scheduling of courses, choosing an academic program, and developing academic assistance, as well as financial, social, and career counseling. The Office is also a link between minority students and other departments within the University and assists in the resolution of problems that arise with faculty, staff, or administrators. In this context, the Office helps to make the students' personal and academic environment conducive to educational growth.

The academic performance of all Black freshmen is monitored within the Office of Minority Student Affairs and the determination is made as to whether or not a student is in good academic standing, to be placed on probation, or dismissed from the University.

For more information about the Office of Minority Student Affairs, call 617-437-2787.

Academic Computer Services

Robert J. Fitzpatrick, B.S., *Acting Director*

During the last two decades the computer has dramatically evolved from an esoteric research-oriented device for solving large numerical problems to a familiar tool in offices, classrooms and industrial environments. At the same time, it has become accessible to users who are not programmers, and need to know only how to use a program written by someone else for the task they need to perform. At Northeastern, the ongoing expansion of computer facilities reflects the University's recognition of this new technology's growing impact and potential over the next decade.

Academic Computer Services, located in the basement of Richards Hall (telephone: 437-2334), supports research activities of faculty, research personnel, and graduate students, as well as teaching and learning activities at both the graduate and undergraduate levels. The computational capability of this facility is supplied by three Digital Equipment Corporation VAX-11/780 systems and one Data General Corporation MV/8000 system. Each of these systems is a state-of-the-art 32-bit virtual memory machine optimized for interactive computing. In addition, there are ten Digital Equipment Corporation LSI-11 microcomputers, each configured with dual floppy disks and video terminal. For more advanced applications, there also exists a multiterminal Computervision Computer-Aided-Design/Computer-Aided-Manufacturing (CAD/CAM) system.

Both students and faculty access these systems in a time-sharing environment through video and hard-copy terminals arranged in student and faculty clusters at the Boston, Burlington, and Dedham campuses. There are also a number of dial-in telephone lines, primarily for faculty use. Color-graphics devices and word-processing packages are also available. The primary languages supported are FORTRAN, COBOL, BASIC, Pascal, and Assembler. Numerous software libraries are available for numerical, statistical, and financial applications. Both faculty and students can readily obtain programming assistance in order to promote effective utilization of all facilities.

Office of Services for the Handicapped

Ruth K. Bork, M.Ed., *Director*

Very often, the degree of physical accessibility and types of available support services play an important part in a disabled student's selection of a college. An examination of Northeastern University's campus map shows the buildings to be located within relatively close proximity to one another. Nearly all buildings have elevators that are open to use by all. A special advantage at Northeastern is the existence of a tunnel system, constructed prior to 1965, that links most buildings; in the harsh New England winters and during inclement weather, this proves to be a welcome feature to all.



Any student who has a disability-related special need—no matter how small or individual—can receive ready support services from the Office of Services for the Handicapped (OSH). Frequently, students are uncertain about how they may be aided by this office, and in these situations a discussion of possible alternatives can be quite helpful. OSH provides a wide range of support services to eliminate the competitive disadvantages that a disability may create. Services are individually tailored to meet the needs of each student.

If you have a disability, you are strongly urged to meet with the staff in OSH early on in your consideration of Northeastern. Together, you can discuss the types of service that would best meet your needs, and you will have an opportunity to see the campus firsthand. If a visit is not possible, contact the OSH Director by phone or by mail to avoid the unnecessary delays and confusion that may arise with last-minute adjustments; telephone: 617-437-2675 (voice) or 617-437-2730 (TTY).

The following types of assistance are available from the Office of Services for the Handicapped:

Orientation—Tailored to the needs of specific disability groups, orientation utilizes tactile maps for vision-impaired students, interpreters for hearing-impaired students, and accessible routes of travel for mobility-impaired students.

Registration and Preregistration—Assistance to help ensure class accessibility and course adaptation.

Counseling—Personal, academic, and referral services.

Housing—Necessary modification in residence halls.

For the Visually Impaired Students—OSH assists in securing taped and braille textbooks and materials; readers; campus orientation; tactile maps; and auxiliary aids such as brailier, Visualtek reader, raised-line drawing kits, large-print typewriter, talking-book machine, magnifiers, talking calculators, variable-speed tape recorders, and Kurzweil Reading Machine.

For the Hearing-Impaired Student—OSH offers services including oral and sign language interpreters; note takers; TTY; audiometric testing, hearing-aid evaluation, fitting, and orientation; instruction in sign language and speech reading; speech therapy. Sign-language interpreting and oral interpreting services will be provided to deaf and hearing-impaired students only after they have been denied such services by their Division of Vocational Rehabilitation, provided the Office of Services for the Handicapped has received information documenting the reason for such denial.

For the Wheelchair User/Mobility-Impaired Student—OSH offers information on appropriate routes of travel, assistance in relocating classes, adaptive physical education, and physical therapy.

General Assistance Services—Includes scribes; advocacy liaison with instructors and other University staff; HP parking; corrective tutoring in English writing, reading, and language problems; special examination situations.

Information Clearinghouse—Offers articles, periodicals, books, and other literature for, about, and by disabled individuals.

The Office of Services for the Handicapped is also the gathering place for the Disabled Student Organization of Northeastern University, which works cooperatively with OSH to plan programs and improve accessibility of services for handicapped persons at Northeastern.

Visitor Information Center

Christopher Mackey, B.A., *Director*

The Visitor Information Center, located in 115 Richards Hall, provides information to visitors to the University campus. The University map; *The Campus: Guide to Northeastern University*; *All Roads Lead To Northeastern University*; *The Northeastern Alumni Magazine*; *The Northeastern Edition*; a full-color University poster; an informational folder; and, other Northeastern catalogs, pamphlets, and brochures are all available at this convenient, central location. Staff members are ready to personally answer questions, give directions, and provide friendly and accurate advice about the university and its programs to visitors, students, staff, and faculty. With a 24-hour notice, visitors or their sponsors may request parking reservations by writing or calling the Visitor Information Center's main telephone number, (617) 437-2736. The Center also produces *The Northeastern University Events Line*, an up-to-the-minute recorded listing of University activities and happenings of interest to the general public and the University community. To find out today's events, call (617) 437-3281 or, when dialing long distance inside Massachusetts, 1-800-322-1277.

Office of Parents' Services

Virginia A. Stephanos, M.S.Ed., *Director*

The Office of Parents' Services provides a central counseling and resources operation for parents of undergraduate and graduate students at Northeastern, facilitating the resolution of problems and exchange of information. The Office maintains contact with the various academic deans' offices, with Cooperative Education, Dean of Students, Financial Aid, Housing, Registrar's Office, Bursar, and other administrative departments that may relate to parents' concerns. In addition, the Office also offers parents social and cultural programs to promote a better understanding of Northeastern's diversified academic and administrative departments.

Academic Assistance Center

Maurice Kaufman, Ph.D., *Director*

The Academic Assistance Center provides diagnosis of academic problems and direct instruction or referral to other units for instruction. The Center will refer students to appropriate services available at Northeastern for help in reading, writing, mathematics, tutoring in specific subjects, and further testing or counseling. In addition, the Center itself provides small group instruction and workshops in reading, study skills, and related areas.

The Governing Boards and Officers of the University

The Corporation

Julius Abrams
William T. Alexander
William F. Allen, Jr.
Yousef A. As'ad
**Diana J. Auger

*Vincent Barletta
Allen G. Barry
Lincoln C. Bateson
*Roy H. Beaton
†F. Gregg Bemis
Beverly Ann Bendekgey
Robert P. Berkowitz
Alfred M. Bertocchi
Gerald W. Blakeley, Jr.
S. Whitney Bradley
Melvin B. Bradshaw
Rexford A. Bristol
Edward W. Brooke
*Frederick L. Brown
William L. Brown
William H. Bruce, Jr.
John L. Burns
Hyman H. Burstein
Victor C. Bynoe

*Louis W. Cabot
*Norman L. Cahnners
*Thomas E. Cargill, Jr.
*Richard P. Chapman
Richard P. Chapman, Jr.
Robert F. Chick
Vessarios G. Chigas
Logan Clarke, Jr.
Livingstone N. Coakley
†David H. Cogan
Abram T. Collier
T. Paul Connolly
James J. Costello
Edward Creiger
H. James Crossan, Jr.
John J. Cullinane

Roger C. Damon
Nelson J. Darling, Jr.
J. H. Dow Davis
Melanie Dean
(Melanie C. Berger)
Virginia Schenkelberger
Devine

*Member of the Board of Trustees
**Honorary Trustee
†Lifetime Trustee, Emeritus

William O. DiPietro
Alfred di Scipio
Estelle Dockser
Dorothy Dodge
**William R. Driver, Jr.
William S. Edgerly
*William Elfers
*Byron K. Elliott
*William P. Ellison
Robert Erickson

*Frank L. Farwell
Joseph D. Feaster, Jr.
*James V. Fetchero
*Eldred L. Field
Phil David Fine
Neal F. Finnegan
Joseph F. Ford
Albert S. Frager
Brenda J. Furlong

Murray J. Gart
Paul W. Glennon
*Lloyd S. Glidden, Jr.
John L. Grandin
**Donald B. Guy

*Allan M. Hale
Edmund Blair Hawley
Michael E. Haynes
Donald P. Hearth
James S. Hekimian
William Hellman
*Ernest Henderson III
Joseph E. Heney
James S. Herbert
Arnold S. Hiatt
Richard D. Hill
Thomas Hollis, Jr.
D. Brainerd Holmes
Robert W. Holmes
Hartwell G. Howe
John S. Howe
Howard M. Hubbard
*Carl R. Hurtig

Richard P. Johnson
*Robert L. Johnson
*Henry C. Jones

*George S. Kariotis
Walter B. Kelley
†Frances Kenerson
Edward M. Kennedy
Fenton G. Keyes

Calvin A. King
 †Asa S. Knowles
 Harvey C. Krentzman
 Evelyn M. Lane
 *John P. LaWare
 Maurice Lazarus
 Allyn Levy
 Elma I. Lewis
 *Kenneth A. Loftman
 Edward A. Loring
 *John Lowell
 *Diane H. Lupean

*Roderick M. MacDougall
 Maurice Mann
 Robert C. Marini
 Evelyn Marran
 **Lawrence H. Martin
 M. Dorothy Massey
 *George J. Matthews
 Walter E. Mattson
 Peter H. McCormick
 William J. McCune, Jr.
 John G. McElwee
 Katherine Seay McHugh
 Percy M. McIntosh
 Dominic Meo, Jr.
 Don G. Mitchell
 Donald H. Moore
 Frank E. Morris
 James A. Morris
 E. James Morton

N. Laurence Nagle
 William H. Nichols, Jr.
 Kathryn M. Nicholson

Bernard J. O'Keefe
 Stanley C. Olsen
 James H. Orr
 Edward O. Owens
 Ara Oztemel

*Augustin H. Parker
 Edward S. Parsons
 *Amelia Peabody
 Theodore R. Peary
 Lawrence T. Perera
 Nicholas V. Petrou
 Edward E. Phillips
 *Thomas L. Phillips
 Edward D. Phinney
 Rudolph F. Pierce
 Jerome M. Powell
 Albert Pratt
 John F. Prendiville
 Peter W. Princi
 William J. Pruynt
 George Putnam

Blanche M. Quaid
 *Francis J. Quirico

William H. Raye, Jr.
 Kathleen M. Rice
 D. Paul Rich
 Robert Riesman

R. Earl Roberson
 Daniel J. Roberts
 †Dwight P. Robinson, Jr.
 Ralph B. Rogers
 Ronald L. Rossetti
 *Kenneth G. Ryder

Ernest J. Sargeant
 Donald W. Seager
 Sydney Shaftman
 James L. Shanahan
 Robert E. Siegfried
 *Dorothy M. Simon
 Phillip A. Singleton
 Paul D. Slater
 **Donald W. Smith
 *Farnham W. Smith
 *Charlotte B. Smith
 *George A. Snell
 O. Phillip Snowden
 *Bernard Solomon
 Robert C. Sprague
 Milton Stern
 David B. Stone
 Ruth S. Stuart

H. Patricia Taylor
 Lawrence I. Templeman
 Charles H. Tenney II
 Almore I. Thompson
 Milton A. Thompson
 W. Nicholas Thorndike
 Alan D. Tobin
 *D. Thomas Trigg
 Paul E. Tsongas
 Joseph F. Turley
 †Chaplin Tyler

Samuel Wakeman
 *Martin F. Walsh
 *An Wang
 Lloyd B. Waring
 James L. Waters
 David T. Wendell
 William C. White
 *Robert H. Willis

Richard W. Young

**Alvin C. Zises

*Member of the Board of Trustees
 **Honorary Trustee
 †Lifetime Trustee, Emeritus

Officers of the Corporation and the Board of Trustees

Robert H. Willis, *Chairman*
Norman L. Cahnors, *Vice Chairman*
Frank L. Farwell, *Vice Chairman*
Farnham W. Smith, *Vice Chairman*
D. Thomas Trigg, *Vice Chairman—Finance*
Philip C. Boyd, *Secretary*
Byron K. Elliott, *Honorary Chairman*
William R. Driver, Jr., *Honorary Vice Chairman*
Dwight P. Robinson, Jr., *Honorary Vice Chairman*

Class of 1983

Vincent Barletta
Roy H. Beaton
Louis W. Cabot
Byron K. Elliott
Kenneth A. Loftman
John Lowell
Roderick M. MacDougall
Augustin H. Parker
Francis J. Quirico
Charlotte B. Smith
An Wang

Class of 1984

Thomas E. Cargill, Jr.
Eldred L. Field
Robert L. Johnson
George S. Kariotis
Diane H. Lupean
Amelia Peabody
Thomas L. Phillips
William J. Pruyn
Dorothy M. Simon
Bernard Solomon
Robert H. Willis

††President of the University

Class of 1985

Norman L. Cahnors
Richard P. Chapman
William Elfers
William P. Ellison
James V. Fetchero
Ernest Henderson III
Carl R. Hurtig
John P. LaWare
George J. Matthews
Ruth S. Stuart

Class of 1986

Frederick L. Brown
Frank L. Farwell
Lloyd S. Glidden, Jr.
Allan M. Hale
Henry C. Jones
Farnham W. Smith
George A. Snell
D. Thomas Trigg
Martin F. Walsh

Ex Officio

††Kenneth G. Ryder

Honorary Trustees

Diana J. Auger
William R. Driver, Jr.
Donald B. Guy
Lawrence H. Martin
Donald W. Smith
Alvin C. Zises

Lifetime Trustees, Emeriti

F. Gregg Bemis
David H. Cogan
Frances Kenerson
Asa S. Knowles
Dwight P. Robinson, Jr.
Chaplin Tyler

Administrative Organization

Officers of the University

Philip T. Crotty, A.B., M.B.A., Ed.D., *Vice President for Academic Operations & Vice Provost*

John A. Curry, A.B., Ed.M., Ed.D., *Senior Vice President for Administration*

Edmund L. Deltano, B.A., *Vice President for Finance*

James B. King, B.A., *Senior Vice President for Public Affairs*

Asa S. Knowles, A.B., A.M., LL.D., Litt.D., Sc.D., D.B.A., Sc.D. in Bus. Ed., *Chancellor*

Melvin Mark, B.S., M.S., Sc.D., *Senior Vice President for Academic Affairs and Provost*

John A. Martin, B.S., M.B.A., *Vice President for Business*

John D. O'Bryant, B.S., M.Ed., *Vice President for Student Affairs*

Eugene M. Reppucci, Jr., B.S., M.Ed., *Vice President for University Development*

Daniel J. Roberts, B.S., M.B.A., Ed.M., *Senior Vice President-Treasurer*

Kenneth G. Ryder, A.B., M.A., L.H.D., *President*

Royal K. Toebe, B.S., M.B.A., *Vice President for Alumni Development*

Karl Weiss, B.S., Ph.D., *Vice President for Research & Vice Provost*

Roy L. Wooldridge, B.S., Ed.M., *Vice President for Cooperative Education*

Academic Deans, Directors of Schools, and General Administrative Officers

Richard Astro, B.A., M.A., Ph.D., *Dean of the College of Arts and Sciences*

Maryann G. Billington, A.B., M.B.A., *Assistant Dean and Director of the Graduate School of Business Administration*

Martin J. Damian, B.S., *Bursar*

Charles Devlin, B.S., M.Ed., *Dean of Student Financial Services*

Theodore N. Ferdinand, B.S., M.S., Ph.D., *Director of the Graduate Program in Criminal Justice*

Clifford J. Fralen, B.S., M.S.E., M.B.A., *Director of the Physical Plant*

William A. Frohlich, B.A., *Dean of University Publishing and Director of University Press*

Job E. Fuchs, M.D., *Director of Health Services*

Joseph M. Golemme, S.B., M.A., C.P.A., *Director of the Graduate School of Professional Accounting*

Thomas E. Hulbert, B.Mgt.E., M.S., *Director of Lincoln College and Associate Dean of Engineering*

Ellen S. Jackson, B.A., Ed.M., C.A.G.S., *Dean and Director of Affirmative Action*

John W. Jordan, B.S., M.Ed., *Dean of University College*

Paul M. Kalaghan, A.B., M.S., Ph.D., *Dean of the College of Computer Science*

Christopher F. Kennedy, A.B., Ed.M., *Dean of Administration*

Philip LaTorre, B.S., M.S., *Dean of Personnel Services and Director of Environmental Health*

Paul M. Lepley, B.S., M.Ed., Ed.D., *Dean of Boston-Bouvé College of Human Development Professions*

Juanita O. Long, B.S.N., M.S.N., C.A.G.S., Ed.D., *Dean of Nursing*

Harold Lurie, B.S., M.S., Ph.D., *Dean of College of Engineering*

Kathryn Luttgens, B.S., M.S., Ph.D., *Associate Provost*

Philip R. McCabe, B.A., M.Ed., *Dean of Admissions*

Philip R. McDonald, B.A., M.B.A., D.B.A., *Dean of the College of Business Administration*

Michael C. Meltsner, A.B., LL.B., *Dean of the School of Law*

Roland H. Moody, A.B., B.L.S., *Director of the University Libraries*

Edmund J. Mullen, B.A., M.Ed., *University Registrar*

J. Edward Neighbor, B.S., M.S., Ph.D., *Associate Dean of the College of Arts and Sciences and Director of the Graduate School*

John L. Neumeyer, B.S., Ph.D., *Director of the Graduate School of Pharmacy and Allied Health Professions*

Paul M. Pratt, B.S., M.Ed., *Dean of the Department of Cooperative Education*

John Proakis, B.S., M.S., Ph.D., *Associate Dean of Engineering and Director of the Graduate School of Engineering*

Edward W. Robinson, B.S., Ed.M., *Dean of Students*

Norman Rosenblatt, A.B., Ph.D., *Dean of Criminal Justice*

Jeanne L. Rowlands, B.A., B.S., M.A., *Director of Women's Athletics*

Gerald E. Schumacher, Pharm.D., M.Sc., Ph.D., *Dean of College of Pharmacy and Allied Health Professions*

Arthur D. Smith, B.S., M.A., Ph.D., *Associate Provost*

Janice Walker, A.B., *Assistant Dean and Director of the Graduate School of Boston-Bouvé College of Human Development Professions*

Joseph Zabitski, B.S., *Director of Men's Athletics*

General University Committees

Academic/Administrative Council, 1983–1984

Kenneth G. Ryder, *Chairman*

John A. Curry, *Vice Chairman*

Melvin Mark, *Vice Chairman*

Barbara F. Burke, *Secretary*

Richard Astro

Holly M. Carter

Charles W. Coffin

Philip T. Crotty

Edmund L. Deltano

Charles H. Ellis, Jr.

Clifford J. Fralen

Humberto F. Goncalves

Ellen S. Jackson

John W. Jordan

Paul M. Kalaghan

Christopher F. Kennedy

James B. King

Roland E. Latham

Philip LaTorre

Paul M. Lepley

Juanita O. Long

Harold Lurie

Kathryn Luttgens

John A. Martin

Philip R. McCabe

Philip R. McDonald

Michael C. Meltsner

Christopher Mosher
John D. O'Bryant
Donald G. Porter
Paul M. Pratt
Eugene M. Reppucci, Jr.
Daniel J. Roberts
Edward W. Robinson

Norman Rosenblatt
Gerald E. Schumacher
Arthur D. Smith
Royal K. Toebes
Joy W. Viola
Karl Weiss
Raymond R. Williams
Roy L. Wooldridge

The Faculty Senate

*Melvin Mark, Presiding Officer

George G. Adams
*Richard Astro
Samuel J. Bernstein
Franklyn K. Brown
Leslie Burg
Richard L. Canale
Holly M. Carter
Sangit Chatterjee
*John A. Curry
Elisabeth M. Drake
Charles H. Ellis, Jr.
Edith E. Flynn
Marvin H. Friedman
Norbert L. Fullington
Bart K. Gruzalski
Robert J. Hehre
Irwin L. Herrnsstadt
Jorge V. Jose
*Paul M. Kalaghan

Margaret E. Leahy
Lila S. Leibowitz
*Paul M. Lepley
*Juanita Long
*Harold Lurie
Bertram J. Malenka
*Philip R. McDonald
Robert A. Millen
*Paul M. Pratt
Richard Rasala
Donald J. Reaves
*Norman Rosenblatt
Robert A. Shatz
*Gerald E. Schumacher
Walter C. Schwab
Pamela A. Stanton
Nancy Walden
Robert N. Wiener

**Appointed by the President*

Academic Calendar 1983–1984

September 1983

1–2	Thursday– Friday	Final Examinations for Basic Colleges.
5	Monday	Labor Day. University closed.
6–7	Tuesday– Wednesday	Final Examinations continue for Basic Colleges.
9–20	Friday– Tuesday	Division A vacation.
15	Thursday	Fall Commencement.
16	Friday	Transfer Orientation.
19	Monday	Freshman Orientation, Boston Class of 1988.
21	Wednesday	Burlington Orientation.
21	Wednesday	Beginning of 1983–1984 academic year. Upperclass registration for Divisions A and C and new freshman course registration.
22	Thursday	Classes begin in Basic Colleges for Fall Quarter.

October 1983

10	Monday	Columbus Day. University closed.
----	--------	---

November 1983

11	Friday	Veterans Day. University closed.
24–26	Thursday– Saturday	Thanksgiving Day recess.

December 1983

12–16	Monday– Friday	Final Examinations for Basic Colleges.
19–January 3	Monday– Tuesday	Christmas vacation.

January 1984

2	Monday	New Year's Day celebrated. University closed.
3	Tuesday	Basic Colleges Only. Orientation of all <i>newly</i> admitted students in Basic Colleges. 9 a.m. upperclass registration Divisions B and C. Start of UC, LC, Graduate Winter Quarter
4	Wednesday	9 a.m. registration of continuing freshmen. 11 a.m. registration of new freshmen. Basic College Classes begin at 1:35 p.m.
16	Monday	Martin Luther King, Jr.'s Birthday celebrated. University closed.

February 1984

20 Monday **Washington's Birthday.** University closed.

March 1984

19–23 Monday–Friday Final examinations for Basic Colleges.

26–31 Monday–Saturday Vacation period for all students in all colleges and schools. (Division B vacation).

April 1984

2 Monday Registration for Divisions A and C and Division A seniors. Registration for freshmen (Quarter Three) at Boston Campus, Burlington Campus, and January freshmen (Quarter Two).
Beginning of Spring Quarter.
Beginning of Division B work period.
No Basic College classes today.

16 Monday **Patriot's Day.** University closed.

May 1984

28 Monday **Memorial Day.** University closed.

June 1984

11–15 Monday–Friday Final Examinations for Basic Colleges (nondegree candidates).

17 Sunday **Commencement.**

18–23 Monday–Saturday Division A vacation.

25 Monday Registration for Divisions B and D and January freshmen (Quarter Three).
Beginning of Summer Quarter.
Beginning of Division B work period.
No Basic College classes today.

29 Friday Monday schedule followed in Day Graduate and Basic Colleges.

July 1984

4 Wednesday **Independence Day.** University closed.

September 1984

3 Monday **Labor Day.** University closed.

4–7 Tuesday–Friday Final Examinations for Basic Colleges.

13 Thursday **Fall Commencement.**

12–24 Monday–Saturday Division B vacation.

19 Wednesday Beginning of 1984–1985 academic year. Upperclass registration for Divisions B and C. Boston and Burlington freshmen complete their registration. No Basic College classes today.

Calendar dates are subject to change. The University community will be notified if such changes are necessary.

NORTHEASTERN UNIVERSITY

Boston, Massachusetts N 7



Academic and Service Buildings

African-American Institute
 Barletta Natatorium
 Boston YMCA
 Botolph Building
 Cabot Physical Education Building
 Cahners Hall
 Cargill Hall
 Churchill Hall
 716 Columbus Avenue
 Cushing Hall
 Dodge Library
 Dana Research Center
 Dockner Hall
 Ell Student Building (Auditorium)
 Ell Student Center (Student Lounge)
 Engineering Building
 Forsyth Building
 Forsyth Building Annex
 Hayden Hall
 Hillel-Frager
 Holmes Hall
 236 Huntington Avenue

B Huttig Hall
 C Karntos Hall
 DE Kerr Hall (Faculty Center)
 DE Knowles Center (Gryzmsh Hall)
 C Knowles Center (Volpe Hall)
 C Lake Hall
 B 334 Massachusetts Avenue
 C Matthews Arena
 D Matthews Arena Annex
 C Meserve Hall
 D Mugar Life Science Building
 C (Peabody Health Professions Center)
 B Newman Center
 D Nightingale Hall
 D Parker Building
 C Peabody Center
 C Richards Hall
 C Ruggles (11 Leon Street)
 C Robinson Hall
 A 122 St. Stephen Street
 B Stearns Center
 F 26 Tavern Road

Key

Academic, Residential, and Service Buildings
 Handicapped Parking
 Handicapped Routes
 Parking Areas
 Public Buildings
 Public Parks
 Street Direction
 Underground Tunnel

Maps are provided by the Visitor Information Center, 115 Richards Hall, extension 2736. Some buildings on this map are used but not owned by Northeastern University 12 30 2 R V 4-87

Gifts and Bequests to Northeastern University

Northeastern University welcomes gifts and bequests to further its educational purposes. It is recommended that those contemplating gifts or bequests confer with the President of the University regarding the needs of the University.

A member of Northeastern University's staff will be happy to consult with those considering a gift or bequest. Planned gifts to the University can often be combined with personal financial goals to produce maximum financial security, as well as significant tax savings for an individual or family.

The legal name of the University is "Northeastern University." In making a gift or bequest, it is recommended the following wording be used: "Northeastern University, an educational institution incorporated under the laws of Massachusetts and located in Boston, Massachusetts."

Index

- Academic calendar, 313–14
- Academic Computer Services, 304
- Accounting
 - concentration in, 140
 - graduate study in, 226–27
- Activities, extracurricular, 277–86
- Admissions, 229–39
 - application for, 233
 - deferred, 234
 - early, 234
 - examinations for, 232–33
 - fee, 233, 242
 - interview, 229–30
 - notification of, 234
 - office of, 229
 - requirements for, 230–33
 - special, 236–37
 - of transfer students, 237–38
- Advanced placement examinations, 232
- Advisers, and placement process, 39
- Affirmative Action, 4
- African-American Studies, programs in, 74–75
- Allied Health Professions; *see* Pharmacy and Allied Health Professions, College of
- Alternative freshman-year program, 217–20, 234
- Alumni Association, 32
- American Sign Language, 52, 92–93
- Anthropology, programs in, 90
- Application, 233; *see also* Admissions
- Applied Social Research, Center for, 29
- Architecture
 - Boston Architectural Center, 42, 93
 - programs in, 41–42
- Arena, 20, 284
- Art, programs in, 41–42
- Arts and Sciences, College of, 37–104
 - Dean's Office for, 39
 - and early acceptance into professional school, 100
 - graduate programs in, 224
 - honors program in, 38–39
 - majors in, 35, 38
 - preparation for, 231
 - special programs in, 91–101
 - undergraduate programs in, 41–104
- Asian Studies, Center for, 92
- Assessment, Tutoring, and Enrichment Resources, Center for, 299
- Athletic programs; *see also* Sports
 - men's, 283–85
 - women's, 285–86
- Attendance, 291
- Audiology, program in, 128–30
- Automobiles, 276
- Awards, 32, 233, 268–74; *see also* Grants; Loans; Scholarships
- Bequests, policy for, 316
- Biology, programs in, 60–62
- Biomedical engineering, program in, 181
- Bookstore, 288
- Boston
 - campus, 18–21, 315
 - and Northeastern University, 10–17
- Boston Architectural Center, 42, 93
- Boston-Bouv   College of Human Development Professions, 106–131
 - admission to, 107
 - facilities of, 106–107
 - graduate programs in, 224–25
 - preparation for, 231
 - transfer to, 108
 - undergraduate programs in, 35, 109–31
- Boston Lyric Opera, 93
- Box office, 98
- British government studies abroad, 93–94
- Business Administration, College of, 132–54
 - arts and sciences minor in, 100
 - basic course requirements in, 139
 - concentrations in, 36, 140–54
 - faculty for, 132–34
 - graduate courses in, 225
 - graduation requirements for, 138
 - honors program in, 136–37
 - minor in, 137–39
 - non-concentration in, 151
 - preparation for, 231
 - professional preparation in, 135–36
 - sample freshman-year program in, 139
 - transfer to, 38
- Cabot Physical Education Center, 284
- Cahners Hall Math/Writing Center, 40
- Calendar, 313–14
- Campus, 18–21
- Campus Media Services, 299
- Career counseling, 294, 296, 301
 - in health professions, 40
- Career development and placement, 296
- Cars, 276
- CATER, 299
- Chemical Analysis, Applications, and Forensic Science, Institute of, 29
- Chemical Engineering, program in, 162–63
- Chemistry, programs in, 63–66
- Children's Center, 109
- Chinese language study, 94
- Civil Engineering, program in, 164–67
- CLEP examinations, 232–33
- Clubs, 278–81
- College-Level Examination Program, 232–33
- Communication
 - speech, 57–58
 - speech-language pathology and audiology, 128–30
- Community Health Education, program in, 124–27
- Compensatory Education Programs, 215–16, 236
 - Cahners Hall Math/Writing Center, 40
 - Reading Clinic, 106, 300
- Composers, League of, 98
- Computer Engineering, 159, 170
 - basic course requirements, 173
- Computer Science, College of, 24, 151–54
 - transfer to, 38
- Computer Services, 304
- Computer Technology, 190–91
- Concert Arts Orchestra, 94
- Conduct, 290
- Continuing Education, Center for, 227
- Cooperative (co-op) education
 - program, 30
 - administration of, 293–96
 - history of, 288
 - international, 100–101, 104, 295
 - length of programs in, 30
 - philosophy of, 8, 293
 - prior to freshman year, 235
 - student's view on, 22
- Cooperative Education Research Center, 29, 296
- Counseling and Testing Center, 301
- Credit, quarter hours of, 34, 289
- Criminal Justice, College of, 155–57
 - graduate programs in, 225–26
 - preparation for, 231
- Curricula
 - innovations in, 24–26
 - personalized, 24
- Curriculum and Instruction
 - program in, 109–10
 - Services, 300
- Dance theatre, 114
- Day-care center, 109
- Dean's list, 290
- Dental Assistant Program, 223–24
- Dental Hygiene, programs in, 198–99

- Disciplinary action, 290
- Discrimination, 4
- Distribution Management, concentration in, 150
- Drama, programs in, 43–44
- Earth Sciences, programs in, 67–68
- Economics, programs in, 76–77
 - in Italy, 95
- Education
 - Institute for the Interdisciplinary Study of, 29
 - programs in, 106–31
- Electrical Engineering, programs in, 168–73
- Electrical Engineering Technology, program in, 187–89
- Electron Microscopy, Center for, 29
- Ell Presidential Scholar awards, 233
- Ell Student Center, 278
 - fee for, 242
- Emergency closing, 291
- Engineering
 - biomedical, 181
 - chemical, 162–63
 - civil, 164–67
 - computer, 159, 170, 173
 - electrical, 168–73
 - environmental, 159
 - general, 158, 182–83
 - industrial, 174–77
 - mechanical, 177–80
 - minorities in, 161
 - power systems, 158, 170, 172–73
 - women in, 160
- Engineering, College of, 158–83
 - cooperative freshman-year program in, 235
 - day cooperative programs in, 158–59
 - graduate programs in, 226
 - part-time program in, 159
 - sample freshman-year program in, 161
- Engineering Technology, programs in, 184–91
 - computer, 190–91
 - electrical, 187–89
 - mechanical, 189–90
- England
 - study of government in, 93–94
 - study of social and human services in, 101
- English
 - compensatory programs in, 40, 106, 215–16, 236, 300
 - for international students, 237, 303
 - programs in, 47–48
- English Language Center, 303
- Entrance examinations, 232
- Entrepreneurship, concentration in, 141–42
- Environmental Engineering, 159
- Equal opportunity policy, 4
- Escort service, 277
- Examinations
 - advanced placement, 232
 - CLEP, 232–33
 - course, 289
 - entrance, 232
 - physical, 239
- Expenses; see also Fees; Financial aid
 - for freshman year, 240–41
 - for room and board, 276
- Extracurricular activities, 277–86
- Family Educational Rights and Privacy Act, 290
- Favat Center, 300
- Federal financial aid programs, 246–48
- Fees
 - application, 233, 242
 - for course overloads, 244
 - for deferred payment, 243
 - financial aid for; see Financial aid
 - freshman and transfer student deposits, 238, 241
 - for freshman year, 240
 - graduation, 242
 - for housing, 275
 - for international students, 242
 - laboratory deposits, 243
 - for late payment, 243
 - for liability insurance, 242
 - medical insurance, 242
 - refunds of, 244
 - for special students, 237
 - student center, 242
 - tuition, 240–41, 243
 - for uniforms, 242, 243
 - for upperclassmen, 241
 - for Warren Center, 243
 - for winter sports, 243
- Field Studies, School for, 95
- Finance, concentration in, 142–44
- Financial aid, 244–74
 - application for, 245
 - eligibility for, 245–46
 - federal programs, 246–48
 - honor society awards, 268–74
 - selection for, 246
 - state scholarships, 246
 - University scholarships, 248–68
- Fine Arts
 - Division of, 95–96
 - programs in, 41–45
- Food services, 277
- Foundations of Education, program in, 111
- Fraternities, 281
 - housing by, 276
- French, for business and economics students, 96
- Freshman orientation programs, 229, 236, 286
- Freshman-year, alternative program for, 217–20, 234
- Geology, programs in, 67–68
- German, business, 96
- Gifts, policy for, 316
- Grades, 289
 - reports on, 290
- Graduate schools
 - information on, 39, 40
 - at Northeastern, 224–27
- Graduation fee, 242
- Grants
 - Pell, 246–47
 - Supplementary Education Opportunity, 247
- Gymnasium, 284
- Handicapped, Office of Services for, 304–305
- Hayden Lodge, 107
- Health care
 - open option in, 197–98
 - for students, 299–300
- Health Education, program in, 124–27
- Health insurance, 242, 300
- Health professions; see Pharmacy and Allied Health Professions, College of
- Health Record Administration, 200–202
- Health Services, 299–300
- High school
 - courses taken during, 235
 - early admission for, 234
- History, programs in, 78–79
- Honors list, 290
- Housing, 275–77
- Human Resources Management, concentration in, 144–45
- Human Services, program in, 79–8130–31
- Humanities
 - Center for, 97
 - programs in, 46–58
- Inclement weather, 291
- Incomplete, 289
- Independent major, 24, 97
- Industrial Engineering, program in, 174–77
- Information Center, 306
- Information Systems, program in, 174–77
- Instructional Development and Evaluation Services, 298
- Instructional Materials Services, 299
- Insurance
 - concentration in, 144
 - medical and liability, 242, 300
- Insurance Institute, 227
- Interdisciplinary Study of Education Institute for the, 29
- International Business, concentration in, 145–48
- International students, 310–302
 - admission of, 237, 302
 - English for, 237, 303
 - fee for, 242
 - office of, 302
- International study programs, 97–98295
 - in China, 92
 - economics in Italy, 95
 - in ecosystem research, 95
 - politics in England, 93–94
 - SeaQuarter, 100
 - social and human services in England, 101

- Interview, for admission, 229–30
- Investment Analysis, concentration in, 143
- Irish studies, 98
- Italy, graduate courses in economics in, 95
- Job counseling, 294, 296, 301
in health professions, 40
- Journalism, programs in, 49–50
- Laboratory fees, 243
- Lane Health Center, 299–300
- Language Pathology, program in, 128–30
- Language; see Modern languages
- Law, School of, 226
- Learning Resources, Office of, 198–99
- Leisure Studies, program in, 121–24
- Liability insurance, 242
- Libraries, 297–98
- Life/Career Planning Program, 294
- Lincoln College, 184–91
facilities for, 185–86
interdisciplinary programs in, 221
part-time programs in, 185, 221
sample freshman-year program in, 187
- Linguistics
minor in, 52, 90
programs in, 50–52
- Loans
Guaranteed Student, 247
Health Professions, 247, 262
National Direct Student, 247–48
Parent, 247
- Lyric Opera, 93
- Majors
independent, 24, 97
undergraduate, 35–36
- Management
concentration in, 148–49
programs in, 135–54
- Management Development, Center for, 225, 227
- Maps, 315
- Marine Science and Maritime Studies Center, 28
SeaQuarter, 100
- Marine Studies, minor in, 99
- Marketing, concentration in, 149
- Mathematics
awards for, 270
CATER center for, 299
compensatory programs in, 40, 215–16, 236
programs in, 59, 68–69
- Matthews Arena, 20, 284
- Meals, 277
- Mechanical Engineering, program in, 177–80
- Mechanical Engineering Technology, program in, 189–90
- Media Production Services, 298
- Media Services
minor in, 99
for the University, 299
- Medical care, 299–300
- Medical insurance, 242, 300
- Medical/Laboratory Science, 202–204
- Medical Records, program in, 200–202
- Medical Technology, program in, 202–204
- Mini-courses, 281
- Minorities
counseling for, 235
Director's Award for, 271
in engineering, 161
King Scholarship for, 256
Saba Award for, 274
special programs for, 235
- Minority Student Affairs, Office of, 303
- Modern languages
American sign, 52, 92–93
Chinese language study, 94
French, for business and economics, 96
German, for business, 96
programs in, 53–54
Spanish, for criminal justice and human services, 103–104
- Multicultural Student Affairs, Office of, 302
- Music
Concert Arts Orchestra, 94
League of Composers, 98
Lyric Opera, 93
programs in, 45
Society for Contemporary, 98
- Natatorium, 106
- Natural Sciences, programs in, 59–68, 70–73
- New England Quarterly, 102
- New Horizons, 281
- New Venture Management, concentration in, 141–42
- Northeastern University
administration of, 307–12
Boston and, 10–17
history of, 288
map of, 315
philosophy of, 8
- Nursing, College of, 192–95
liability insurance for, 242
uniforms for, 242
- Open Campus Plan, 235
- Open Option program, 26
- Organizations, 278–81
- Orientation
of freshmen, 236, 286
preadmission, 229
of transfer students, 238
- Outstanding Alumni Awards, 32
- Parent Loan Program, 247
- Parents' Services, Office of, 306
- Parking, 276
- Parsons Field, 284
- Pass-fail system, 289
- Pell Grants, 246–47
- Personality, specialization in, 99
- Personnel Management, concentration in, 144–45
- Pharmacy, program in, 205–207
- Pharmacy and Allied Health Professions, College of, 196–215
career counseling for, 40
liability insurance in, 242
uniforms for, 242
- Philosophy, programs in, 55–56
- Photo-identification card, 283
- Physical Distribution Management, concentration in, 150
- Physical Education, program in, 112–17
- Physical Form, 239
- Physical Therapy, program in, 118–20
- Physician Assistant program, 210–12
- Physics, programs in, 70–73
- Placement
advanced, 232
in arts and sciences program, 39
in jobs, 296
- Political Science, program in, 81–83
- Power Systems Engineering, 158, 170
basic course requirements in, 172–73
- Preprofessional advising, 301
- PRIME program, 161
- Professional Promise Awards, 32
- Professional schools, 224–27
- Professional societies, 281, 282
- Programs
changes by University in, 288
length of, 30
selection of, 233
special, in arts and sciences, 91–102
- Progress in Minorities in Engineering program, 161
- Project Ujima Program, 235
- Psychology
programs in, 83–85
social, specialization in, 90
- Radiologic Technology Program, 222–23
- Reading Clinic, 106, 300
- Reading skills
remedial, 106, 215–16, 236
speed, 300
- Records, inspection of, 290
- Recreation and Leisure Studies, program in, 121–24
- Registration, 236
of transfer students, 238
- Religion, programs in, 55
- Religious organizations, 280
- Religious services, 283
- Research, 27–29
- Research Center, for Cooperative Education, 29, 296
- Reserve Officers' Training Corps, 291–93
uniform deposit for, 243
- Residence halls, 275

- Respiratory Therapy, program in, 212–15
- Risk Management, concentration in, 144
- Romanticism Past and Present, 102
- Room and board, 276–77
 - expenses for, 240–41
 - refund of, 244
- ROTC, 291–93
 - uniform deposit for, 243
- Russell J. Call Children's Center, 109
- Russian studies, minor in, 100
- Schedule, of classes, 313–14
- Scholarships; see *also* Awards; Grants; Loans
 - Ell Scholar awards, 233
 - federal programs, 246–48
 - for ROTC, 292, 293
 - from state, 246
 - from University, 248–68
- School and Community Health Education, program in, 124–27
- SeaQuarter, 100
- Security precautions, 277
- Sign language, 52, 92–93
- Small Business Management, concentration in, 141–42
- Snow cancellations, 291
- Social Sciences, programs in, 73–90
- Sociology, programs in, 86, 90
- Sororities, 282
- Spanish, for criminal justice and human services, 100–101
- Speech Communication, programs in, 57–58
- Speech-Language Pathology and Audiology, program in, 128–30
- Speed reading, 300
- Sports, 282
 - arena, 20, 284
 - athletic programs, 283–86
 - facilities, 284
 - teams and clubs, 114
 - winter, fees for, 243
- State scholarship programs, 246
- Student activities, 277–86
- Student center, 278
 - fee for, 242
- Student ID card, 283
- Student loans, 247–48
- Studies in American Fiction, 102
- Study skills, 215–16, 236
- Swimming pool, 106
- Tennessee Williams Review, 102
- Testing, 301; see *also* Examinations
- Tickets, for events, 95
- Tour, of University, 229
- Toxicology, program in, 208–10
- Transcripts, 289
- Transfer students
 - admission of, 237–38
 - to business or computer science, 38
- Transportation Management, concentration in, 150
- Trent Polytechnic exchange program, 101
- Tuition
 - amounts, 240–41
 - for course overloads, 244
 - deferred payment of, 243
 - late payment of, 243
 - payment of, 243
 - refund of, 244
- Tutoring, in math and writing, 40, 299; see *also* Compensatory Education Programs
- Ujima, Project, 235
- Uniforms, fees for, 242, 243
- University College
 - alternative freshman-year program in, 217–20, 234
 - full-time day programs in, 222–24
 - part-time evening programs in, 221–22
- Urban Studies, minor in, 101
- Veterans, 292
- Visitor Information Center, 306
- Warren Center, 107
 - fees for, 243
- Withdrawal, and refund of tuition, 244
- Women
 - in engineering, 160
 - in engineering technology, 187
- Women's Studies, minor in, 101
- Work-study program, 247; see *also* Cooperative (co-op) education program
- Writing skills, 40, 215–16, 236



Northeastern University

State-of-the-Art Engineering 1983-84

Center for Continuing Education
370 Common Street
Dedham, Massachusetts 02026
Telephone: 617-329-8000

Professional Development Programs for
Practicing Engineers, Scientists, and Managers

Delivery of Services

The University assumes no liability, and hereby expressly negates the same, for failure to provide, or delay in providing, educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements, and acts of public authorities. The University will, however, exert reasonable efforts, when, in its judgment, it is appropriate to do so, to provide comparable or substantially equivalent services, facilities or performance, but its inability or failure to do so shall not subject it to liability.

The Northeastern University catalog contains *current information* regarding the University calendar, admissions, degree requirements, fees, and regulations, and such information is not intended to be and should not be relied upon as a statement of the University's contractual undertakings.

Northeastern University reserves the right in its sole judgment to promulgate and change rules and regulations and to make changes of any nature in its program, calendar, admissions policies, procedures and standards, degree requirements, fees, and academic schedule whenever it is deemed necessary or desirable, including, without limitation, changes in course content, rescheduled classes, cancelling scheduled classes and other academic activities, and requiring or affording alternatives for scheduled classes or other academic activities, in any such case giving such notice as is reasonably practicable under the circumstances.

We at Northeastern will do our best to make available to you the finest education we can provide, the most stimulating atmosphere in which to learn, and the most congenial conditions under which you may enjoy the learning experience. But the quality and the rate of progress of your academic career is in large measure dependent upon your own abilities, commitment, and effort. You will be a full participant in an educational partnership. We will and, indeed, can only make the opportunities available to you; it is up to you to take advantage of them.

This is equally true with your career upon graduation. We cannot guarantee that you will obtain any particular job; that will depend upon your own skills, achievement, presentation, and other factors such as market conditions at that time. Similarly, in many professions and occupations, there are increasing requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These may change during the period of time when you are at Northeastern, and they may vary from state to state. Although we will be ready to help you find out about these requirements and changes, it is your responsibility to initiate the inquiry because we cannot know what your expectations and understandings are unless you tell us.

In brief, what we are saying to you is that we are here to offer you educational opportunities and choices and to assist you in finding the direction in which you want to steer your educational experience. But you are a partner in this venture with an obligation and responsibility to yourself.

Accreditation

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states. Accreditation by the Association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators.

Equal Opportunity Policy

Northeastern University is committed to a policy of providing equal opportunity to all. In all matters involving admissions, registration, and all official relationships with students, including evaluation of academic performance, the University insists on a policy of nondiscrimination.

Northeastern University is also an equal opportunity employer; it is institutional policy that there shall not be any discrimination against any employee or applicant for employment because of race, color, religion, sex, age, national origin, or on the basis of being a handicapped, but otherwise qualified individual. Further, Northeastern will not condone any form of sexual harassment.

Inquiries concerning our equal opportunity policies may be referred to the University Title IX Coordinator/Compliance Officer for Section 504 of the Rehabilitation Act of 1973, Affirmative Action Office, 175 Richards Hall; telephone 617-437-2133.

Family Educational Rights and Privacy Act

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records whenever appropriate and to challenge specific parts of them when they feel it necessary to do so. Specific details of the law as it applies to Northeastern are printed in the *University College/Lincoln College Student Handbook*. Copies are available on request in 102 Churchill Hall at the Boston campus; telephone 617-437-2400. Copies are also generally available at each of the University's suburban campus locations.

Office of Services for the Handicapped

The Office of Services for the Handicapped (OSH) provides a variety of support services and general assistance to all of Northeastern's handicapped students and employees. The University's efforts to comply with the Rehabilitation Act of 1973 are coordinated by Ruth Bork, OSH Director, 5 Ell Center, 617-437-2675.

Emergency Closing of the University

Northeastern University has made arrangements to notify students, faculty, and staff by radio when it becomes necessary to cancel classes because of extremely inclement weather. Radio stations WBZ, WHAV, WHDH, WRKO, WKOX, WVBF, WFNX, WNTN, WTPP, WHUE, WBCN, WCOZ, WEEL, WMRE, WRBB, WCAS, WJDA, WBOS, WLLH, WXKS, WROR, and WILD will announce the University's decision to close. Many classes meet in public and private schools. Therefore, some branch campus locations will be forced to close while others will not. When listening to radio announcements, students are advised to note the status of classes at their particular location.

Fee Disclaimer

Tuition rates, all fees, rules and regulations, courses and course content are subject to revision by the President and the Board of Trustees at any time.



Henderson House, Northeastern University's conference facility, located in Weston, Massachusetts.

CONTENTS

Academic Calendar 1983-84	6
The University	7
Center for Continuing Education	8
State-of-the-Art Engineering Program	10
Academic Policies	12
Tuition and Fees	14
Programs of Study	16
Computer Science and Engineering	16
Semiconductor Science and Microelectronics	16
Communications and Systems Engineering	17
Technical Management	18
Course Descriptions	21
Course Index	54
Faculty	57
Maps	60

ACADEMIC CALENDAR 1983-84

Fall Quarter 1983, Classes begin September 26, 1983.

Fall registration	September 6-10, 12-14
Fall quarter classes begin	September 26
Columbus Day observed*	October 10
Veterans Day observed*	November 11
Thanksgiving recess*	November 24-26

Winter Quarter 1984, Classes begin January 3, 1984.

Winter registration	December 5-9
Christmas vacation*	December 19-January 2
Winter quarter classes begin	January 3
Martin Luther King, Jr.'s Birthday observed*	January 16
President's Day observed*	February 20
Spring recess (or make-up period for snow days)	March 27-31

Spring Quarter 1984, Classes begin April 2, 1984.

Spring registration	March 12-15
Spring quarter classes begin	April 2
Patriots' Day observed*	April 16
Memorial Day observed*	May 28

*No classes held on these dates. Calendar changes may be made.
The University community will be notified if such changes occur.

THE UNIVERSITY

Founded in 1898, Northeastern University is incorporated, under the General Laws of Massachusetts, as a privately endowed nonsectarian institution of higher learning. By special enactment, the state legislature has given the University general degree-granting powers. The University is governed by a Board of Trustees elected by and from the Northeastern University Corporation, a body of nearly two hundred distinguished business and professional men and women.

A distinctive feature of Northeastern University is its Cooperative Plan, under which students alternate periods of work and study. This time-tested method of education offers students the opportunity to gain valuable practical experience as an integral part of their college programs and to contribute to the financing of their education.

In addition to seven colleges offering more than seventy undergraduate majors, the University has nine graduate schools offering day and evening programs.

In the field of adult education, Northeastern University offers graduate and undergraduate degree programs and noncredit programs that are specifically designed to meet the needs and interests of adults who wish to further their education on a part-time basis. University College is a large, part-time undergraduate college offering more than one thousand courses in thirty-three degree programs. The Center for Continuing Education offers workshops, conferences, and special programs in a wide variety of professional and technical areas.

All formal courses of study leading to degrees in the graduate division, Lincoln College, and University College are approved by the respective undergraduate faculties, and are governed by the same qualitative and quantitative standards as the regular day curricula. Courses are scheduled in the day and evening at Northeastern's campuses in Boston, Burlington, Belmont, Brockton, Chelmsford, Dedham, Framingham, Lynnfield, Marlborough, Marshfield, Milford, North Attleboro, Norwood, Revere, Westwood, and Weymouth.

For more information about the undergraduate colleges, their programs, or the Cooperative Plan of Education, contact the Admissions Office, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115; telephone 617-437-2200. For more information about University College, telephone 617-437-2400.

CENTER FOR CONTINUING EDUCATION

Northeastern University established the Center for Continuing Education in 1960 in response to a perceived need for quality adult education in a period of unprecedented change. It became clear that it was no longer adequate merely to keep pace with a changing world; it became crucial to anticipate changes before they became apparent. Northeastern's goal, then, became one of providing its students with a wide variety of carefully prepared programs designed to allow them to make viable personal and professional decisions based on increased consciousness of social and technological changes.

The Center today offers programs including State-of-the-Art Engineering, Emergency Medical Technician and Paramedic training, Food Service, Graphic Arts, Transportation Management, and Paralegal.

Creating Programs to Meet Your Needs

The Center for Continuing Education offers a full range of training and development services to industry. Center staff are experienced in the assessment of training needs, curriculum development, modern methods of instructional technology, career planning, and program evaluation.

Any of the Center's programs may be conducted on location at a variety of organizations. In addition, new programs can be developed to meet specific requirements. Some of the benefits of customized programs include:

- Flexible scheduling to match the requirements of participants and the organization
- Substantial cost and travel-time savings
- Ability to select a site most convenient to participants
- Programs specifically tailored to meet the needs of particular organizations

For more information about any of these possibilities, please contact Carl H. Mellin at 617-329-8000.

CENTER FOR CONTINUING EDUCATION ADMINISTRATIVE OFFICERS

John W. Jordan, Dean, University College

John H. Robbins, Jr., Director, Center for Continuing Education

Kenneth C. Solano, Associate Director, Center for Continuing Education

Malcolm J. Campbell, Director, National Urban Mass Transportation Management Seminar Program

Edward J. Czarnowski, Director, Insurance Institute

Stephen M. Diamond, Director, Engineering Programs

Carl H. Mellin, Assistant Director, Engineering Programs

David M. Rayne, Director, Emergency Medical Programs

Louise E. Crossen, Program Assistant

Deborah J. Piascik, Program Assistant

Catherine D. Zeigler, Program Assistant

STATE-OF-THE-ART ENGINEERING PROGRAM

The proliferation of new knowledge and application areas has made it increasingly difficult for professionals to keep pace with advances in today's fast-moving technology. Since 1964, the State-of-the-Art Program has made a significant contribution to continuing professional education in the high-technology and science-related areas. Today, the Program is recognized as a primary educational resource among working professionals and the technology-oriented organizations they serve throughout New England.

Well over ten thousand working professionals—engineers, scientists, and managers—have participated in more than five hundred unique courses, seminars, and workshops conducted by the State-of-the-Art Program. The Program provides an excellent opportunity for participants to stay abreast of the most recent developments in their fields, to gain new knowledge and skills, to enhance on-the-job performance, and to increase their potential for advancement.

The State-of-the-Art Program takes into account the mature, dedicated nature of its professional audience. Faculty are leading contributors and practitioners affiliated with industry, academe, and government. Courses are conducted in an interactive, participative setting, providing for the achievement of personal learning objectives and the introduction of work-related problems. Class size is limited, and formal and informal feedback by participants is encouraged.

This year, the State-of-the-Art Program has developed and introduced a number of new courses important to professionals employed in the high-technology industry. These new courses focus on topics including advances in computer architecture, robotics, and microelectronics.

All State-of-the-Art Engineering Program courses are described in this catalogue beginning on page 21.

Program Administration

Administrative Officers

Stephen M. Diamond, A.B., M.S., M.P.A.
Director

Carl H. Mellin, B.A., M.B.A.
Assistant Director

Catherine D. Zeigler, B.A.
Program Assistant

Marjorie A. Duffy, B.A.
Secretary

Patricia L. Hooley
Secretary

Executive Committee

Thomas E. Hulbert, M.S., P.E.

Director, Lincoln College

Paula G. Leventman, B.A., M.A., Ph.D.

Assistant to the Dean, College of Engineering

Robert W. O'Connor, Ed.D.

Associate Dean, University College

John J. Proakis, Ph.D.

Director, Graduate School of Engineering

John H. Robbins, Jr., B.A., M.Ed.

Director, Center for Continuing Education

Academic Advisory Council

Paul C. Barr, Ph.D., P.E.

Computer Science and Engineering

Steven D. Mittleman, B.S., M.S., Ph.D.

Semiconductor Science and Microelectronics

Ronald O. Brown, B.S.E.E., M.S.E.E., Ph.D.

Communications and Systems Engineering

Theodore F. Gautschi, Ph.D., P.E.

Technical Management

ACADEMIC POLICIES

Admissions

The State-of-the-Art Engineering Program offers an open-admission policy. Students may enroll in one or more courses by simply following the registration procedures outlined below. Academic advisers are available throughout the year by appointment to help students plan their programs and select courses.

Continuing Education Units

Continuing Education Units (CEUs) are nationally recognized measurements of participation in a qualified continuing education program. One CEU is awarded for 500 contact minutes of such participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction.

Students attending seminars and/or courses at Northeastern University's Center for Continuing Education receive CEUs for successful completion of such courses. The number of CEUs applicable to each course is listed in the course schedule.

Grading Policy

Participants are graded on a pass/fail basis. Attendance at a minimum of 75 percent of class sessions is required for a passing grade. An optional letter grade may be earned through examination or by completion of a paper or project assignment as directed by the instructor.

Certificate Programs

Certificates of Professional Achievement may be earned in the following areas by successfully completing a planned sequence of courses. No more than three of the six courses taken to fulfill requirements for a certificate may be taken on a pass/fail basis. Participants must earn a letter grade of B or better in three courses to be eligible to earn a certificate. See Programs of Study for detailed information about the following:

- Software Engineering
- Semiconductor Science and Microelectronics
- Telecommunications Technology
- Telecommunications Management
- Technical Management

Certificate programs are designed as flexible mechanisms for professional career development. Courses of study are based upon individual career objectives and are structured to provide maximum convenience. Courses are offered in a variety of formats, including evening courses, seminars, and workshops to conform to particular needs.

Individuals intending to earn a certificate must file a petition during the quarter in which requirements will be completed. Petition forms are available in the State-of-the-Art Program office, 370 Common Street, Dedham, Massachusetts 02026.

Registration

Registration for State-of-the-Art courses may be made by mail, in person, or by telephone. To register by mail, complete the registration form included with the course schedule and mail it to the Continuing Education Registrar, 120 Hayden Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115. To register in person, fill out a registration form in the office of the Continuing Education Registrar at the above address. To register by telephone, call the State-of-the-Art Program office at 617-329-8000.

Participants are urged to register early. Because textbooks and other course-related materials must be ordered special to ensure their availability in sufficient time prior to the beginning of classes, late registrants may experience a delay in receiving course materials.

Most courses require a minimum of ten participants. Cancellation of courses with insufficient enrollments begins two weeks prior to the scheduled beginning of classes. If participants notify the program office of their intention to enroll sufficiently in advance, a greater number of courses can be offered.

Course Cancellations

Northeastern University reserves the right to cancel courses with insufficient enrollment. Changes in the days, dates, and times of courses will be made only when dictated by unforeseen circumstances.

Transcripts

The Registrar's office maintains permanent records of participation in all courses. Transcript information is continually updated, and a complete record of course participation is included in each transcript. Transcript information can be released only on receipt of the participant's written request. Participants may obtain a transcript of their record by completing a request form, in person, at the Registrar's office. Transcripts may also be requested by writing to the Registrar, 120 Hayden Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115.

A \$2 payment must accompany each transcript request to defray service costs. Inquiries regarding transcript requests can be made by telephoning 617-437-2199.

Changes and Corrections

Participants who need to make changes in their records should direct a letter to the Registrar's office at the above address in order to initiate those changes. Changes to be made through the Registrar's office include name, address, or Social Security number.

TUITION AND FEES

Tuition for each course is specified in the course schedule available from the State-of-the-Art Program office. Course tuition, unless otherwise specified, includes textbooks and/or course materials and all fees.

Payment is due the first week of the course. A check, money order, or authorized company purchase order should be sent at that time to the Bursar, 245 Richards Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115. Checks should be made payable to Northeastern University. Payment by VISA or MasterCard is also accepted.

Payment for intensive, all-day seminar offerings is due in full prior to the start of the seminar. All checks and correspondence must be legibly marked with the course number and title, as well as the participant's Social Security number. The latter becomes a permanent program identification number for record keeping, transcripts, and mailing purposes.

For information about educational assistance benefits through the Veterans Administration, consult the Office of Veterans Services, 116 Hayden Hall, telephone 617-437-2283.

Questions regarding course tuition payments and other financial matters should be referred to the Bursar, 245 Richards Hall, telephone 617-437-2270.

Income Tax Allowances

Treasury Regulation 1.162.5 permits an income tax deduction for educational expenses (registration fees and cost of travel, meals, and lodging) undertaken to: 1) maintain or improve skills required in one's employment or other trade or business, or 2) meet express requirements of an employer or a law imposed as a condition of retention of employment, job status, or rate of compensation.

Tuition Refunds, Credits, and Course Withdrawals

If a course cannot be offered due to insufficient enrollment, any tuition payments already received will be refunded to all registrants.

Participants may withdraw from a course or courses, and a tuition credit will be granted as specified in the schedule below. To qualify for a tuition credit, participants must file a written notice of course withdrawal and forward it to the Registrar, 120 Hayden Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115. Non-attendance or notification of withdrawal to faculty alone does not constitute official withdrawal, and a tuition credit cannot be allowed on that basis.

Course withdrawal forms are available at the Registrar's office and at various course locations. If it is impossible for participants to obtain these forms, a letter of notification of withdrawal will be accepted. Tuition credit will be granted only on the basis of the date appearing on the withdrawal form or letter.

In the event of course withdrawal, tuition credit is prorated according to the following schedule:

Time of Withdrawal	Tuition Credit
First calendar week of classes	100 percent
Second calendar week	75 percent
Third calendar week	50 percent
Fourth calendar week	25 percent

No tuition credit can be allowed for withdrawal after the fourth calendar week of classes. Within the above time limit, the participant must return, in good condition, all course-related materials received, including textbooks, in order to qualify for the full amount of the allowable tuition credit. Otherwise, the cost of course materials will be deducted from the tuition credit.

When tuition credit is granted, the amount will be automatically credited to the participant's account and applied toward future tuition costs. If a refund is desired, the participant must make a formal, written request through the Bursar's Office, 245 Richards Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115.

This tuition credit and refund policy applies only to courses that are regularly advertised and scheduled and meet on a weekly basis. Cancellation of registration for Intensive All-Day Seminar offerings received less than five workdays prior to the start of the seminar is subject to a \$25 service charge.



PROGRAMS OF STUDY

COMPUTER SCIENCE AND ENGINEERING

In today's technology, a computer may be anything from a bit slice, microprocessor, or process-control device, to a complex robotics system. The Computer Science and Engineering programs offer the most recent technologies, designs, and applications in each area of this rapidly expanding field.

This year, several new courses are being introduced in artificial intelligence, CAD/CAM, and robotics technology. To meet the popular demands of the personal computer revolution, a series of courses have been developed to help the user explore the inner workings and applications of common systems. Offerings in microcomputer systems have been expanded, and courses have been added in the C-language and UNIX* operating system.

Because of the growing emphasis on software development, a program is offered in this area. A Certificate of Professional Achievement may be earned in software engineering by successfully completing a planned sequence of six of the following courses:

Program in Software Engineering

Introductory Courses (three):

- 09.730 Software Engineering for Hardware Designers
- 09.747 Software Verification and Validation
- 09.783 Software Engineering Economics

Advanced Courses (select three from the following):

- 06.750 Data-Base Systems Concepts
- 09.726 Design of Computer Operating Systems
- 09.743 Computer Microprogramming and Emulation
- 09.781 UNIX Operating System
- 09.748 Principles of Software Reliability
- 09.782 C-Programming Language
- 09.780 ADA Programming Language
- 09.770 Z-80 Assembler Language Programming
- 09.784 PDP-11 Assembler Language Programming

* UNIX is a registered trademark of Bell Laboratories.

SEMICONDUCTOR SCIENCE AND MICROELECTRONICS

Advances in semiconductor and integrated-circuit devices are revolutionizing the electronics industry. New high-resolution lithographic techniques are making possible the fabrication of chips containing millions of transistors and having dimensions smaller than the wavelength of visible light.

This very large-scale integration (VLSI) revolution presents numerous challenges for process engineers, circuit designers, computer scientists, and managers. Northeastern University's Semiconductor Science and Microelectronics program is designed to help meet these challenges. A wide range of state-of-the-art courses is offered in topics including integrated circuit fabrication, VLSI design, microelectronics interconnection and

packaging, and computer-aided design. In addition, a series of courses is offered in semiconductor fundamentals for individuals having minimal background in the field.

Participants may earn a Certificate of Professional Achievement in semiconductor science and microelectronics by satisfactorily completing a planned sequence of six courses as follows:

Program in Semiconductor Science and Microelectronics

Introductory Courses (three):

03.772 Introduction to Solid-State Principles

03.773 Principles of Semiconductor Devices

03.774 Integrated Circuit Fabrication

Advanced Courses (select three from the following):

01.751 Crystal Growth and Characterization

03.754 Semiconductor Optoelectronics I: Photodetectors

03.755 Semiconductor Optoelectronics II: Lasers and Emitters

03.765 VLSI Gate Array Design

03.778 Microelectronic Testing and Quality Assurance
Techniques

03.799 Microelectronic Interconnection and Packaging

COMMUNICATIONS AND SYSTEMS ENGINEERING

A wide range of courses is offered for the professional involved in the communications and systems-engineering fields. Offerings in communications theory include digital signal processing, modulation techniques, and detection theory. A series of courses focus on systems design, including reliability and maintainability factors.

The Telecommunications program is designed to enable professionals to keep abreast of the rapidly changing communications capabilities. Technological innovations have made new services feasible, and deregulation has resulted in a variety of competitive alternatives.

The program offers the telecommunications professional two integrated options. A Certificate of Professional Achievement may be earned in either telecommunications technology or management. Each program begins with a sequence of courses in the principles of telecommunications, both voice and data. Upon satisfactory completion of these courses, advanced courses are selected in either technology or management. The technology option is designed for those who are active in the engineering and design of telecommunications equipment, systems, and networks. Technology courses range from specific techniques, such as fiber optics, to courses that are systems oriented, such as automated office systems. The management option is designed for those involved in the management and operation of telecommunications systems. Courses in this area cover topics such as network operations, system procurement, and network administration.

Program in Telecommunications Technology

Introductory Courses (four):

- 03.737 Principles of Telecommunications I
- 03.738 Principles of Telecommunications II
- 49.725 Transmission Techniques
- 49.726 Telecommunications Switching Systems

Advanced Courses (select two from the following):

- 03.700 Communications Theory
- 03.728 Satellite Communications
- 09.727 Introduction to Data Communications Systems
- 03.726 Optical Fiber Communications Systems
- 03.771 Local Area Networks
- 49.722 ISDN Workshop
- 49.727 Teletraffic Engineering
- 49.750 Automated Office Systems
- 09.712 Digital Signal Processing
- 03.743 Applications of Digital Signal Processing
- 03.730 Detection of Signals in Noise
- 03.732 Digital Modulation Techniques
- 49.723 Network Operations

Program in Telecommunications Management

Introductory Courses (four):

- 03.737 Principles of Telecommunications I
- 03.738 Principles of Telecommunications II
- 49.720 Network Administration
- 49.721 Telecommunications Regulations

Advanced Courses (select two from the following):

- 03.728 Satellite Communications
- 09.727 Introduction to Data Communications Systems
- 03.771 Local Area Networks
- 49.722 ISDN Workshop
- 49.750 Automated Office Systems
- 49.723 Network Operations
- 49.724 System Procurement
- 08.700 Finance for Technical Professionals
- 08.703 Technical Project Administration

TECHNICAL MANAGEMENT

Northeastern University's Technical Management Program is designed to meet the need for effective management in today's fast-paced technological environment. Designed primarily for engineers and other technical personnel who will assume managerial responsibilities, the program is also intended to benefit front-line supervisors and middle managers who desire to improve their effectiveness. Emphasis is placed on developing results-oriented managers possessing decision-making, problem-solving, and communications skills.

The program is conducted in an interactive, participative setting wherein personal learning objectives may be achieved and work-related problems introduced. Courses are offered during the fall, winter, and spring quarters. It may be possible to

complete the program in less than two years and receive the Certificate of Professional Achievement in Technical Management.

Program Requirements

A bachelor's degree in an engineering or science area is a prerequisite to this program. This requirement may, however, be waived under special circumstances. In addition, participants are expected to be employed in a technological capacity, because discussion of work-related problems is an integral part of the program. The program requires the successful completion of 1) five core courses, 2) two elective courses, 3) a seminar in communications or problem-solving skills, and 4) practicum experience.

Core Courses

- 08.707 Modern Technical Management—Human Aspects
- 08.708 Modern Technical Management—Functional Aspects
- 08.703 Technical Project Administration
- 08.709 Marketing Management for Technical Professionals
- 08.700 Finance for Technical Professionals

Elective Sequence

Two courses selected from the following:

- 05.751 Material Requirements Planning
- 07.753 Industrial Safety Management
- 08.766 Quality Improvement Programs
- 08.701 Product Liability and Safety
- 08.705 Principles of Product Assurance
- 08.710 Legal and Business Aspects of Innovation
- 08.711 Sales Skills for Technical Professionals
- 08.750 Advanced Program Management
- 08.751 New Product Development
- 08.763 Software Project Management
- 08.764 Technological Forecasting

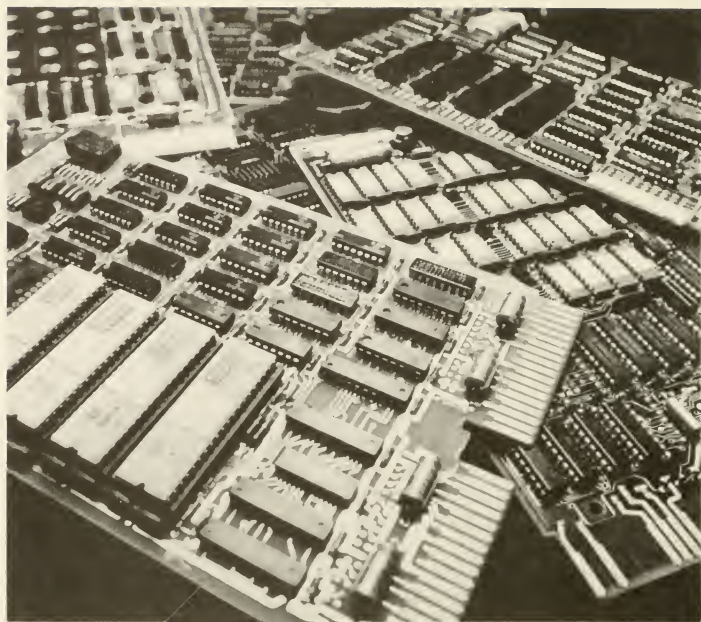
One seminar selected from the following:

- 29.798 Seminar in Innovation and Problem Solving
- 29.775 Seminar in Technical Report Writing
- 29.799 Seminar in Effective Speaking Skills

Practicum Experience

- 08.765 Practicum in Technical Management

The practicum is the capstone of the Technical Management program. Participants select a project related to their own work experience and complete a substantial report, drawing upon concepts acquired in the core curriculum and elective sequence.



COURSE DESCRIPTIONS

COMPUTER SCIENCE AND ENGINEERING

Introduction to Computers

09.785 Introduction to Computers for Managers and Professionals

Advances in computer applications make it increasingly important for professionals to have an understanding of modern, information-processing systems. This course is designed for engineers, managers, and other professionals with little or no prior background in computers. The entire subject of computers is introduced, including systems concepts, programming and software, data communications, privacy, and system development. Discussion also focuses on the nature of computers, how they work, what they can and cannot do, how to plan and select a computer system, and common pitfalls to avoid.

09.775 The Personal Computer Revolution

Personal Computers are revolutionizing the home, office, and work environments. This course surveys the range of available equipment, including both hardware and software, focusing on selecting the right system for applications in word processing, business, personal finance, entertainment, and education. Topics will include microprocessor technology and the impact of microelectronics, elements of a personal computer system, including disk drives, printers, monitors, color displays, applications software packages, and a look at future trends.

Microcomputer Systems

03.749 Introduction to Microcomputer Systems

Designed for engineers, programmers, and technical managers who desire an understanding of the underlying concepts of microcomputer system elements. Operation and features of 8- and 16-bit LSI integrated-circuit devices used to create complete micro-computer systems are described. System design, using the Z-80, 6205, 8088, and 68000 microcomputer families, is described. Features of each CPU family are compared and related to appropriate application areas. The course provides a background for more advanced courses in microcomputer systems.

03.757 8-Bit Microprocessor Systems: The Z-80 Family

Focuses on fundamentals of the Z-80 microprocessor. Beginning with a basic review of microprocessor architecture and basic instruction sets, the course moves into a detailed description of the Z-80 family of devices, including hardware system design. The instruction set is thoroughly reviewed with numerous programming examples. The course then focuses on basic application programs, covering examples such as process control, data communication, and numerous practical programming algorithms. Assembly-level language is used for software solutions.

03.792 16-Bit Microprocessor Systems: The 8088/8086 Family
Introduces 16-bit microprocessor technology through an examination of the Intel 8088/8086 family of devices. Discussion focuses on advanced architectural concepts, including memory management, multilevel vectored interrupts, and co-processing. Also covered are the 8086 Numeric Data Processor and the 8089 Input/Output Processor chips, which are capable of increasing through-put up to 100 times that of one basic processor. Available software will be surveyed, including cross-assemblers, 8080 emulators, and operating systems. Application areas will include a discussion of the IBM personal computer. A course equivalent to 03.749 Introduction to Microcomputer Systems is recommended background.

03.793 16-Bit Microprocessor Systems: The 68000 Family
This course surveys hardware and software aspects of the M68000 family of devices 68000, 68010, and 68020, with special emphasis on applications. Topics include instruction sets, protection mechanisms, advanced capabilities (24- to 32-bit addressing, memory management, and exceptions); and advanced applications, including real time, multitasking, and kernel structures. Aspects of system development and test procedures will also be discussed. A course equivalent to 03.749 Introduction to Microcomputer Systems is recommended background.

03.780 High Integration Microprocessors
A survey of the available, or soon-to-be available, state-of-the-art microprocessors. This course provides participants an intensive look at new products available from Intel, Zilog, and National Semiconductor. Included will be discussions of the 80186, NS16032, and 8096 processors. Special emphasis is placed upon the interconnection of family devices and their applications to personal computers, communication processors, and intelligent peripheral control. A course equivalent to 03.749 Introduction to Microcomputer Systems and some familiarity with assembler-level programming are recommended background.

09.771 Microcomputer Interfacing and Bus Structures
Surveys Industry Standard Bus Structures, including the Prolog Standard Bus, Intel Multibus/IEEE 796, IEEE 488, Instrument Bus, S-100, and VME-Eurocards. Discussion of each bus includes a technical description of pinouts, interface-timing requirements, and design rules for building boards. In addition, a thorough market analysis of many board manufacturers is provided, such as floppy-disk controllers, and 68000-based systems on multibus. Other topics include interfacing through gateways and using local area networks, operating system considerations, and future trends. A course equivalent to 03.749 Introduction to Microcomputer Systems is a recommended background.

03.766 Microcomputer Operating Systems
Surveys common microcomputer operating systems, including CP/M, MP/M, MS-DOS, and UNIX. Topics include resource management, multitasking, device drivers, logical devices,

device independence, and disk-file structures. Discussion will focus on comparisons and trade-offs among operating systems for various applications. Participants should have acquired a background in microcomputer systems organization and some knowledge of assembly-level programming.

03.794 Microcomputer Communications and Networking

Central to all computer systems are means of communicating information, within both the system itself and the outside world. This course focuses on data-communications technology applicable to modern microcomputer systems. Topics include data representation, protocols, synchronization concepts, distributed controls, and interfacing through gateways and local area networks. Discussion also includes a survey of graphics technology, and future trends. A course equivalent to 03.749 Introduction to Microcomputer Systems is recommended as background.

03.702 Bit-Slice Microcomputer Design: Part I

03.742 Bit-Slice Microcomputer Design: Part II

With the advent of high-speed, bit-slice LSI integrated circuits, a special-purpose microcomputer may readily be structured using a minimal number of components. This two-quarter course covers the design of special-purpose microcomputers for applications when off-the-shelf, single-chip LSI microprocessors do not meet performance requirements.

Part I consists of the design of microcomputers, including a survey of available integrated circuits, architectural concepts, hardware-software tradeoffs, and logic design. A knowledge of combinatorial and sequential logic, as well as flowcharting techniques, is assumed.

Part II is comprised of firmware design and debugging techniques. Fully developed case studies are used to illustrate course content. This is a continuation of course 03.702 and assumes a thorough knowledge of its content.

Computer Automation

09.734 Computerized Process Control

Computer and control fundamentals, as they pertain to process systems, combined with a survey of current topics of interest within the process-control industry are studied.

Topics include process-control hardware and software systems, input/output subsystems, and color graphics and operator interfaces. Applications in areas such as temperature control, sequential batching, and project scoping are discussed. Classical-control theory and its relationship to the PID-control algorithm are reviewed. Participants are provided an opportunity to reinforce these concepts via simulations on the University's time-sharing computer.

Additionally, commercially available process computers are presented with process languages which can be used to implement optimal control strategies.

09.786 Introduction to CAD/CAM Technology

CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) is revolutionizing modern product design, drafting, and production techniques. An effective CAD/CAM program can result in dramatic improvements in productivity. This course is aimed at engineers and manufacturing managers, designers, drafting supervisors, and others desiring an introduction to emerging CAD/CAM technology. Topics include a survey of available hardware and software for various applications, feasibility determination, system selection, the role of management implementation, including human problems and other potential pitfalls, and system evaluation. The features of particular turnkey systems are highlighted by guest lecturers. A design session on an actual CAD/CAM system is also scheduled during the course.

09.737 Advanced CAD/CAM Workshop

This course is intended for individuals already familiar with CAD/CAM technology who desire intensive hands-on training. Utilizing the ComputerVision CADS IV System, participants will have an opportunity to explore applications in mechanical design, printed-circuit layout, and electrical design. The course will be conducted in a workshop format and participants are offered an opportunity to become involved in one or more work-related projects. Background equivalent to 09.786 Introduction to CAD/CAM Technology is required.

03.722 Data Acquisition Systems

The problems and techniques involved with sensing analog situations, preconditioning, multiplexing, sampling, and quantizing data for digital storage or computer processing. System and hardware concepts from the analog input through A/D conversion are considered. Principles of sampling theory and data system parameters affecting the sampled signals are discussed, as are existing specifications. The course also examines the many aspects of the digital concept of the data-acquisition system. Topics such as error analysis, D/A conversion, digital circuitry, timing and control, storage units, output devices, computers, and basics of system design are discussed. Emphasis is placed on the role of minicomputers and microprocessors in data-acquisition systems. The establishment of system requirements and their relation to equipment parameters are discussed, providing participants an opportunity to learn to specify and design data-acquisition systems.

05.750 Advances in Manufacturing Technologies

This course surveys recent state-of-the-art advances in manufacturing technology. Topics include thermocompression bonding, laser applications, automatic inspection and insertion, robotics, inertia welding, squeeze casting and hot isostatic pressing (HIP), computer-aided manufacturing, and the use of advanced composite materials. The integration of automatic techniques leading to the Factory of the Future is the central theme for class discussion.

Artificial Intelligence and Robotics

05.720 Introduction to Artificial Intelligence

Artificial intelligence (AI) is an aspect of computer science dealing with machine reproduction of intelligent human behavior. Recent attention has been focused on natural language development, image processing, automatic programming, and robotics. This course surveys these AI topics and others as class interest dictates, concentrating on the fundamental ideas, techniques, and applications in each area. The course provides an introduction to emerging AI technologies to computer scientists, engineers, managers, and others desiring such background. Participants should be familiar with computer systems and have experience in one or more programming languages.

05.721 LISP Programming in Artificial Intelligence

LISP is a modern symbol-manipulation language commonly used in artificial intelligence research. This course introduces the fundamental concepts and practical applications of LISP programming. Topics include symbol manipulation, recursion and iteration, basic debugging tools, data-driven programming, and building-embedded interpreters and compilers. Participants should have acquired experience in one or more programming languages and have some familiarity with artificial intelligence concepts. Course 05.720 Introduction to Artificial Intelligence is recommended background.

05.701 Pattern Recognition and Robotics

Designed to help familiarize participants with the principles, techniques, and applications of pattern recognition in technical, medical, and industrial areas and in robotics. The course focuses on automatic machine classification—the categorization of subjects of interest on the basis of a battery of measurements made with one or more local or remote sensors. Course discussions center on the machine learning and derivation of the decision algorithms needed to achieve classification of sensed data, and on the techniques used in classifying data and extracting important decision parameters from them. Robot design is used as a means for illustrating and tying together the pattern-recognition methodology presented in the course. Participants have an opportunity to gain familiarity with available algorithms and examples of pattern-recognition systems in use, as well as the thoughts and problems associated with new and pending pattern-recognition applications.

05.722 Machine Vision and Manipulation

Explores the current status, potential, and future direction of sensory feedback and adaptive control systems in robotics. Topics include fixed and mobile camera applications, vision-based guidance, touch-and-force sensors, real-time control systems, and the use of sensors in programmable automation and error correction. A background in electromechanical principles is presumed.

05.723 Industrial Robotics Technology

A survey of the fundamentals, trends, and applications of industrial robots. Material ranges from economic analysis and feasibility

determination to a discussion of the state of the art in machine vision and sensory technology. Application areas are drawn from material handling, machinery, casting, welding, inspection, and assembly operations. A knowledge of digital systems and/or industrial processes is recommended background for this course.

05.752 Speech Synthesis and Recognition

This course surveys recent advances in computer recognition and synthesis of human speech. Topics include elements of acoustics, phonetic detection, speech perception, dynamic time warping, and context constraints. System-implementation issues, including available hardware and software, impacts on application programs, the need for speaker training, and the economics of voice I/O, will also be discussed. Course 05.720 Introduction to Artificial Intelligence is recommended background.

05.753 Knowledge Engineering

Knowledge engineering is the application of artificial intelligence techniques to the representation, storage, retrieval, association, deduction, and presentation of information. Topics discussed in this course include alternative representations of knowledge, uniqueness of representation, problems with unspecified knowledge, semantic networks, and expert systems. Participants should have a working knowledge of LISP programming and some familiarity with artificial intelligence concepts.

Digital Computer Technology

09.744 Principles of Digital Logic Design

The techniques of digital logic, as applied to the design and analysis of digital systems, are the main focus of this course. Prior formal training in digital circuits is not necessary because the course provides instruction in all background topics required; number systems, Boolean algebra, logic gates, and minimization techniques. The principles of synchronous and asynchronous logic design are offered with emphasis on the practical aspects of design. Current logic families are investigated, and the features of each family are discussed. Design principles are extensively illustrated by discussion of numerous examples. This course provides background for more advanced courses in computer engineering.

03.759 Interactive Computer Graphics

Interactive computer graphics is the most natural form of man-machine communication currently available. Offering the advantages of visualization, animation, and speed, computer graphics has matured into a powerful scientific and engineering tool. It is an increasingly important aid in simulation, Computer-Aided Design (CAD), and engineering education. This course addresses the objectives, techniques, and problems of interactive graphics and offers participants an opportunity to acquire a greater appreciation of the options inherent in designing and using graphics systems. Interactive I/O devices, algorithms, data structures, and display devices are considered from the perspectives of the graphics system designer, system programmer, application programmer, and CAD user. Familiarity with programming is desirable, but not necessary for participation.

09.790 Design of Fault-Tolerant Digital Systems

Fault tolerance or ultrareliability is a necessary feature of computer systems for applications in financial institutions, hospitals, and the airline industry, among others. This course addresses redundancy and fault-tolerant design techniques in digital systems. Topics include design alternatives, cost-performance trade-offs, and future trends. Participants should have acquired a background in digital logic and computer architecture.

03.791 Video Graphic Display Technology

This course surveys emerging video display technologies related to the design and operation of alphanumeric and graphic terminal systems. Topics include Raster graphic techniques, cost-performance trade-offs among various system implementations, and a discussion of ergonomic factors in the design of human-computer interfaces. Major focuses of the course are a survey of existing hardware and software available for minimicrocomputer systems, and an examination of future trends.

09.791 Array Processors in Digital Signal Processing

This intensive course surveys the marketplace in array processors for systems ranging from microcomputers to the large mainframes. Array processing is introduced from concepts to functions and applications. The primary emphasis is on the application of array processors to problems arising in processing sampled analog signals. The various competitive devices available are analyzed and compared. Participants should be familiar with the elements of digital signal processing, computing structures, and programming techniques.

09.792 EMI Control in EDP Equipment

This is a very timely course considering the recent actions and decisions of the FCC. It presents the fundamentals of electromagnetic interference (EMI) control in the design of electronic data-processing (EDP) equipment. A complete discussion is given to both the A and B rules. Distinctly different sets of technical and administrative requirements are in effect for Classes A and B computing devices. Techniques for testing and procedures for device certification are also covered. Other topics include board layout and design criteria, signal and power-cable shielding, filtering and grounding, and EMI measurement.

09.794 Advances in Computer Architecture

Addresses state-of-the-art approaches to solving problems of classical computer architecture. Several in-depth case studies focus on the Intel iAPX432, the IBM SWARD, and other machine organizations. Topics include tagged storage, capability-based addressing, process management, protection domains, and error detection. A strong knowledge of computer systems organization is presumed.

Software Engineering

09.730 Software Engineering for Hardware Designers

Presents the relevant aspects of software engineering for hardware designers who seek to bridge the computer software/hardware gap. Initially, the basic principles of computer systems and programming are introduced. The course then addresses the full spectrum of systems-programming activities, including the use and implementation of assemblers, macros, loaders, compilers, and operating systems. Each of these components is discussed in detail, and pertinent design issues are exposed, thus demonstrating the realistic possibilities for software-engineering trade-offs. The concepts introduced in the course are presented within the context of modern operating systems and computer languages such as PL-1 and PASCAL. A familiarity with programming is helpful, but not required.

09.726 Design of Computer Operating Systems

Intended to be of benefit to computer systems programmers and hardware designers, as well as managers and users. The primary purpose of the course is to provide an opportunity for students to analyze and design computer-operating systems of current and future interest. As such, the course is particularly relevant for operating systems and real-time programmers. The course is also intended to be of use in improving awareness of the operating-systems interface between systems hardware and the user, in assisting in systems evaluation and selection, and in developing a better understanding of the user-system interface.

Issues of mechanisms versus issues of policy are identified and discussed, and the key resources—memory, processors, devices, and information—are categorized and explained. Models are developed for the purpose of systems design and system-performance evaluation. Familiarity with computer programming in both high-level and assembly language is a course prerequisite.

09.743 Computer Microprogramming and Emulation

The need to rewrite existing software programs to meet the requirements of new-generation computer systems is a subject of increasing concern to computer systems users, programmers, and designers. An effective approach to minimizing or eliminating program rewriting in new hardware-conversion situations is found in the combined application of microprogramming and emulation techniques. This course introduces and explores the principles, techniques, and advantages of microprogramming and emulation, and their coordinated application to the creation of software programs compatible with computers of varying nature.

06.750 Data-Base Systems Concepts

This course is designed to present a rational approach to the design, development, and administration of data-base information systems. The major Data-Base Management Systems, including IMS, IDS, II, IDMS, INGRES, TOTAL, ADABAS, and Model 204, are evaluated and contrasted. Additional topics include determining feasibility, normalized design techniques, distributed data-base systems, and successful implementation strategies. This

course may be valuable for data-base administrators. A working knowledge of EDP systems and operations is presumed.

06.754 Logical Data-Base Design

Designed for programmers, analysts, administrators, and end users of data-base structures. Discussions include data definition; entities and relationships; methods to develop the conceptual data-base model; normalization of data; and how to design business needs into existing or new data bases. Network, hierarchical, and relational Data Base Management Systems are included. Emphasis is placed on long-term benefits of proper data-base design. Course 06.750 Data-Base Systems Concepts or the equivalent is recommended background.

06.755 Physical Data-Base Design

Designed for analysts, system programmers, data-base administrators, and technically oriented users of data-base structures. File structures, chains, rings, trees, plex structures, indexes, compaction techniques, and storage hierarchies are explored. Mapping the logical model into the appropriate physical model is stressed. Effective methods of data tuning and monitoring are discussed, and data-base performance issues are addressed. Course 06.750 Data-Base Systems Concepts or the equivalent is recommended background.

09.747 Software Verification and Validation

As software systems become more complex, verification and validation measures become key ingredients of the modern software engineering function. This course surveys approaches to verification and validation that have been used successfully on large-scale software-development projects. Topics include modern testing technology, automation, and the integration of verification and validation activities over the full software life cycle. Emphasis is placed on cost, schedule, and management realities in the software-production environment. Although there are no formal prerequisites for this course, participants should have an understanding of basic software engineering concepts.

29.715 Software Documentation and Manual Preparation

This course aims at helping to develop the skills necessary to communicate effectively with user and technical audiences in the computer industry. Topics will include HIPO diagrams and flowcharting, handling information sources, use of graphics, technical-manual preparation, and documentation standards. The course is conducted in a workshop format, and participants will have an opportunity to participate in a manual-writing project.

09.781 The UNIX Operating System

The UNIX operating system, developed at Bell Laboratories, is emerging as the standard for 16-bit microcomputers. Written in the structured language C, UNIX is widely acclaimed for its portability and user-friendly, text-processing and file-management facilities. This course introduces participants to the text editor,

command-language features, and file structure of the UNIX system. Familiarity with the C Programming language and operating system concepts is recommended.

09.748 Principles of Software Reliability

Designed for programmers, analysts, data-processing managers, and others involved in the production of software. The major approaches to the design of reliable programs and the solution of software errors are discussed. Specific topics include establishing requirements and objectives, trade-off analysis, fault detection and error isolation, documentation and standards, structured design and coding, software testing, debugging, and reliability models. Participants should be familiar with computer organization and have acquired experience with one or more high-level programming languages.

09.783 Software Engineering Economics

The rapid increase in demand for computer software is creating numerous new challenges for software engineering professionals. Of particular importance is the improvement of economic productivity in both development and maintenance activities. This course aims at applying economic analysis techniques to software engineering decisions. It is recommended for software engineers, programmers, systems analysts, and project managers. Topics include microeconomic concepts as they apply to software engineering, factors affecting software costs, the software life cycle, cost estimating, risk analysis, project planning and control, and computer modeling. An introductory course in microeconomics would be helpful but is not required.

Programming Languages

09.782 C Programming Language

Developed at Bell Laboratories, C is a high-level programming language that is rapidly gaining acceptance in both systems and applications programming. This course introduces the C language, including comparisons with other languages, programming techniques and program structure, compiler construction, and interfacing to the UNIX operating system.

09.780 ADA Programming Language

ADA is the modern high-level programming language recently developed by the United States Department of Defense for implementing large-scale, real-time applications. The language is a major advance in programming technology and represents the first substantial effort to identify programming requirements and effectively satisfy them. Applications include control of nonstandard I/O devices, process control, systems programming, distributed processing, and managing concurrent activities. This course is an overview of the major principles of the ADA language. Emphasis is placed on effective use of advanced features, including modularity and data abstraction, generic units, exception handling, strong typing, separate but not independent compilation, and distributed tasking. Some familiarity with PASCAL programming is helpful but not required.

09.745 Programming and Problem Solving with PASCAL

Recent technological advances in the development of computer hardware have altered the balance of the hardware/software effort in relation to the total computer-system effort. Currently, the cost of computing is clearly dominated by the cost of software, and it is becoming increasingly necessary that modern programming practices and high-order languages be used in the development of software, regardless of the size of the computer used. Designed to help provide professionals the tools needed for software development, the course focuses on programming practices at an introductory level.

The course emphasizes the aspects of the programming problem-solving process: problem specification and organization, algorithms, coding, debugging, testing, documentation, and maintenance; the elements of good programming style and the means of producing a high-quality finished product; and the teaching of the syntax of the PASCAL programming language. Programming examples are chosen to span a wide range of both numeric and non-numeric applications. No prior programming experience is required.

09.746 Advanced Programming Techniques with PASCAL

Advanced programming skills using the PASCAL language's full power and flexibility. The representation of basic data structures (array, records, sets, and files) is examined, and the creation and manipulation of various data aggregations (matrices, lists, stacks, queues, rings, and trees) are developed. These techniques are applied in a wide range of applications (searching, sorting, recursion, backtracking, and parsing) from language processing, database management, and operating systems problems. 09.745 Programming and Problem Solving with PASCAL or the equivalent is required background.

Assembler Language**09.770 Z-80 Assembler Language Programming**

Introduces the Z-80 assembler language and progresses to advanced techniques for microprocessor software development. Sample programs are used for discussion, and participants create and test their own programs. Explanation of basic terminology problem definition; and writing, implementing, and testing programs are covered. Course 03.749 Introduction to Microcomputer Systems or the equivalent is required background.

09.784 PDP-11 Assembler Language Programming

The Digital Equipment Corporation PDP-11 has become established standard equipment among minicomputers. This course introduces the PDP-11 assembler language and machine organization. Coverage of the RT-11, RSX-11m, and RSTS/E operating systems is also included. Participants have an opportunity to implement various assembly-level and high-level application programs on each operating system. Some background in mini-computer systems and programming is recommended but not required.

Personal Computers

09.795 Inside the Apple: An Engineer's View

Explores, in detail, the hardware design and bus-level interfacing of the Apple II Computer. Various hardware peripherals, including the unique floppy-disk design, are discussed, as is the DOS operating system. A background in microcomputer fundamentals is presumed.

09.796 The IBM Personal Computer

An introduction to personal computers, this course covers programming in BASIC, operating systems, application programs, and a hardware overview of the IBM computer. A course equivalent to 09.785 Introduction to Computers is recommended background.

09.797 The TRS-80 Personal Computer and BASIC

Intended as an in-depth course in BASIC language programming, focusing on the Radio Shack TRS-80 personal computer. The course explores the many applications of the language, including business programs, games, and process I/O programming. A course equivalent to 09.785 Introduction to Computers is recommended background.





SEMICONDUCTOR SCIENCE AND MICROELECTRONICS

Semiconductor Science

03.772 Introduction to Solid-State Principles

Serves as an introduction to the underlying principles important to an understanding of solid-state electronic devices. Helpful to those with no background in the field and to those who have taken a course in solid-state physics and desire a review. Course content includes electronic conduction, waves in crystals, dielectric and magnetic principles, piezoelectricity, optoelectronic materials, and thermoelectric effects. Some background in elementary physics is helpful.

03.773 Principles of Semiconductor Devices

Recommended for engineers, scientists, and others desiring an introduction to modern semiconductor devices. Topics include crystal properties and growth of semiconductors, energy bands and charge carriers, p-n junctions, MOS logic devices, field-effect transistors, bipolar and current injection logic, integrated circuits, and charge-coupled devices. A knowledge of solid-state principles is recommended.

03.754 Semiconductor Optoelectronics I: Photodetectors

03.755 Semiconductor Optoelectronics II: Lasers and Emitters

For optical and infrared engineers and scientists, program managers, systems engineers, and technicians, this two-part course covers fundamental principles and current applications of solid-state (primarily semiconductor) optoelectronic devices operating in the visible and infrared spectral regions. Included in this course are the operating principles and characteristics of infrared detectors, diode lasers, and systems using these and related semiconductor devices. Particular emphasis is on recent developments.

Although the courses are complementary, each may be taken independently and in the sequence desired by the participant. Part one introduces the fundamentals of solid-state visible and infrared detectors, with emphasis on basic operating principles and important areas of application. Part two covers basic principles of semiconductor lasers and emitters of incoherent radiation in the UV, visible, and IR spectral regions. Current areas of research and development, as well as practical applications, are reviewed.

Part one presents an introduction and overview of photodetection. Properties of electromagnetic radiation and properties of semiconductors. Definition and significance of detector terms. Operating principles of photon detectors (photoconductors and photodiodes), and thermal detectors (thermocouple bolometers, and pyroelectric). Modern materials for solid-state photodetectors. Device fabrication methods. Detector cooling techniques. Recent advances in high-speed photodiodes, heterodyne detection, optical mixing, and other areas, depending on class interest.

Part two presents an introduction and overview of semiconductor optoelectronic emitters. Basic principles of radiative recombination in semiconductors. Incoherent emitters of visible and

infrared radiation. Design and operating principles. Diode lasers from the visible through far-infrared spectral regions. Modern materials, crystal growth, and device fabrication methods. Applications in the areas of communication, ranging, display, heterodyne detection, spectroscopy, and monitoring. Course 03.722 Introduction to Solid State Principles or the equivalent is recommended background.

01.751 Crystal Growth and Characterization

Examination of the critical areas for control and optimization of semiconductor crystal growth processes. The course surveys recent technological advances and examines techniques for improved quality and yield. Work-related problems are solicited from the class. The course consists of four segments: 1) an introduction to basic crystallography and techniques for characterizing crystals, 2) growth from the gas phase, 3) the melt, and 4) solutions. New or recently modified growth techniques are also introduced. Topics are weighted to reflect class interest.

03.710 Microwave Semiconductor Engineering

This course introduces the field of microwave semiconductor engineering from the perspectives of device physics and device-circuit interaction. Topics include physics of semiconductors, reliability estimates, driver circuits, matrix theory, and microwave semiconductor networks. Course 03.773 Principles of Semiconductor Devices or the equivalent is recommended background.

Microelectronics

03.774 Integrated Circuit Fabrication

A detailed examination of integrated-circuit processing methods. The course provides a background to beginning process engineers and others with semiconductor experience who desire knowledge of IC fabrication. Course content includes silicon wafer preparation, epitaxy, ion implantation and thermal processes, chemical vapor deposition, photolithography and etching, plasma processes, and process-control techniques. 03.773 Principles of Semiconductor Devices or the equivalent is recommended background.

03.713 Advances in Submicron Fabrication Techniques

There is extensive current research at the forefront of fine-line fabrication technology. This course presents the fundamentals, as well as recent, advances in lithographies, resist properties, and special fabrication techniques. Optical, electron-beam, X-ray, and ion-beam lithographies are analyzed and compared. Special topics relevant to submicron structure fabrication, such as reactive ion etching, multilevel lithography, shadowing, and general applications, are also discussed. A background equivalent to 03.774 Integrated Circuit Fabrication is recommended.

03.769 Custom VLSI Design

The establishment of silicon foundries has provided a low-cost method for fabricating custom large-scale integrated/very large-

scale integrated (LSI/VLSI) circuits. Users of the foundry are required to describe the mask designs of their circuit in one of several data formats. This course focuses on the Caltech Intermediate Format (CIF) and is based on the Mead/Conway design methodology for n-channel metal-oxide-semiconductor (MOS) custom integrated circuits.

Topics include the operation and performance of the MOS transistor, stick diagrams, and circuit-layout examples using the Mead/Conway design rules. Custom integrated circuit (IC) Computer Aided Design (CAD) system configurations, and sources for design and verification software will be discussed. A case history of the design, fabrication, and test of a custom integrated circuit will be presented. A visit to a custom IC-design facility may be scheduled with a demonstration of a color graphics layout editor and a number of design verification software programs.

This course is intended for design engineers, computer scientists, and managers having either hardware or software design experience. Design experience with digital transistor-transistor logic (TTL) and some background in programming would be helpful but is not required.

03.711 Advanced Custom VLSI Design Workshop

The use of computer-aided design (CAD) and verification tools, in conjunction with circuit synthesis tools and "macrocell" circuit library functions with predictable performance parameters, has become a realistic and cost-effective approach to implementing low-cost custom integrated circuits (ICs) for use in low-volume applications.

This course begins with a review of a complete set of custom IC design tools, including programmed logic array (PLA) and read-only memory (ROM) synthesis tools. The use of these tools, in conjunction with a parametrized "macrocell" circuit library, is capable of producing a custom IC. Computer terminals and a graphics-plotting device are provided, and hands-on workshop exercises allow participants an opportunity to acquire the principles of custom IC design. These design tools also include the capability for creating, simulating, and generating test-pattern waveforms for project designs.

Participants have an opportunity to learn the concepts of custom IC implementation by designing and verifying either a unique circuit function or a complete custom IC. At the end of the course, participants will have an opportunity to participate in a "silicon foundry" multichip wafer-fabrication project which will provide prototype custom circuits at an additional cost.

This course is intended for design engineers, computer scientists, and managers who have either completed 03.769 Custom VLSI Design or have equivalent background. A knowledge of TTL design is also recommended.

03.765 VLSI Gate Array Design

One VLSI Gate Array IC is currently capable of replacing one to three printed boards of digital logic. This course deals with all aspects of gate arrays from economic and feasibility concerns to detailed design and layout, and it begins with an overview in

which terms and definitions are given. The course continues by delineating the need for, and application of, gate arrays and then describes current manufacturers and the types of devices they are capable of producing. Design sessions follow in which students have an opportunity to become familiar with methods of designing and laying out the various elements of a custom digital gate-array IC. Information is provided on how to determine both the technical and economic feasibility of a candidate circuit, typical costs and turnaround time, how to interface with vendors, and how to test a gate array. The flow of gate-array processing is also emphasized.

03.799 Microelectronic Interconnection and Packaging

Modern LSI devices are performance limited by thermal, mechanical, and electrical problems associated with interconnection and packaging. This course takes a systems approach to the optimization of packaging options from the standpoints of cost, performance, reliability, and ease of production. The most recent developments in semiconductor package-design factors, power dissipation and thermal management, connectors for microelectronic packages, mounting practices, handling small geometries and critical contact areas, production testing, functional trade-offs, and economic consideration are included.

03.778 Microelectronic Testing and Quality Assurance Techniques

Introduces testing and quality assurance techniques aimed at improving the yield of semiconductor process operations. Topics include wafer testing, using automatic test equipment (ATE), probe and final test-pattern parametric data, yield assessment, and microelectronic failure analysis. A background in semiconductor processing is presumed.





COMMUNICATIONS AND SYSTEMS ENGINEERING

Systems Theory and Design

09.722 System Reliability Engineering

A systematic treatment of reliability theory applied to the solution of system and circuit problems. Intended for design, system, and reliability engineers, this course provides an opportunity to understand factors influencing hardware performance longevity, its measurements, and improvement. From modeling simple, nonredundant systems through complex, multimoded systems, the concepts emphasize quantitative treatment of system success, using the tools of probability transition diagrams and matrix algebra. Systems requiring low maintenance and high operational readiness are examined in view of practical constraints—economic and otherwise. Familiarity with elementary statistics and data analysis is presumed.

09.773 Design Practices in System Maintainability

A treatment of maintainability theory and practice for engineers, managers, and others who have an interest in the requirements of MIL-STD-470 (maintainability programs), MIL-STD-471 (maintainability demonstration testing), and MIL-HDBK-472 (maintainability prediction techniques). Corrective and preventive-maintenance considerations for the designer of modern, complex electronic systems are covered, emphasizing equipment availability and reduced life-cycle costs. Applications of principles to commercial product lines are also included, with a view toward establishing decision criteria for maintenance crew size and skills, overhaul periods, and checkout test frequency. The course offers an opportunity for project managers to acquire methods of establishing and directing maintainability programs, and appraising program results. Familiarity with reliability principles is helpful but not required.

Communications Theory

03.700 Principles of Communications Theory

The underlying principles of communication system design and analysis are discussed. Mathematical concepts are illustrated through the use of numerous examples. Participants have an opportunity to acquire the necessary skills to characterize signals, use Fourier transforms, analyze communication system performance, and apply specific techniques to the design of communication systems. This course serves as preparation for advanced state-of-the-art courses in communications. A working knowledge of integral and differential calculus is presumed.

09.712 Digital Signal Processing

The increasing application of digital circuitry and new signal-processing techniques has changed the design methodology for communications transceivers and modems, vocoders, radars, sonars, and other real-time signal processors. The same new signal-processing techniques are also being used on general-

purpose digital computers for engineering-system simulation and for spectral and statistical analysis of experimental data. Central to these signal-processing techniques are the concepts of digital filtering and the fast Fourier transform. This course emphasizes the application of discrete time methods to continuous time processes. A familiarity with continuous time signal and systems analysis is necessary background.

03.743 Applications of Digital Signal Processing

The contemporary applications of digital signal processing in speech and data transmission, in radar and sonar, and in medical and industrial instrumentation require a familiarity with a diversity of topics in signal quantization, digital filter design, spectral analysis, and adaptive equalization and filtering. This course provides an in-depth coverage of digital filtering and spectral analysis with emphasis on engineering interpretation of methods and results, and on both hardware and software implementation questions. Topics covered include quantization methods and models, IIR and FIR filter design (with emphasis on CAD tools), FFT algorithms, high-resolution spectral analysis (maximum entropy and related methods), adaptive equalizers, and filters. Additional topics and special applications may be covered as class interest dictates. Course 09.712 Digital Signal Processing or an equivalent knowledge of discrete time-systems analysis provides the proper background.

03.730 Detection of Signals in Noise

The theory of signal detectability underlies the design and analysis of signal processing and detection algorithms in communication and radar systems. This course may be helpful to design and development engineers who desire a working knowledge of these theoretical concepts as they apply to a wide variety of information-processing systems. A mathematically detailed, but engineering-oriented, introduction to the limits of signal detection in noise is presented. Theoretical development is paralleled by examples of important applications. A working knowledge of probability and random-process theory is required.

03.732 Digital Modulation Techniques

This applications-oriented course is designed as an introduction to digital modulation and transmission and may also provide an update and review for individuals with experience in the field. The course focuses on developing an understanding of underlying physical principles in combination with an organized knowledge of applications and system performance. Initially, digital and analog approaches are reviewed and compared, with subsequent attention on the digital approaches. Important digital modulation techniques are exemplified, and their applications are detailed, discussed, and compared, providing participants an opportunity to learn to evaluate the relative and absolute performance of the various techniques and systems. Participation in the course assumes completion of 03.700 Principles of Communications Theory or equivalent background.

49.793 Coding and Information Theory

The representation, transmission, and transformation of information are fundamental to telecommunications and computer science, among others. This course provides a practical introduction to coding and information theory. Topics include error-detecting codes, variable-length (Huffman) codes, entropy and Shannon's theorem, channel capacity, and algebraic coding theory. A knowledge of college-level algebra and calculus is presumed.

Telecommunications Systems Technology**03.737 Principles of Telecommunications: Part I****03.738 Principles of Telecommunications: Part II**

This two-part course is designed for computer and communications engineers, managers, and other technical personnel involved in telecommunications-related professions who are seeking knowledge of many aspects of telecommunications networks and operations. The course may also form the basis for advanced study of the topics covered. The course includes detailed discussion of telecommunications switching and transmission techniques and systems, as well as network operations and maintenance. Special voice and data network offerings, including packet-switched offerings, are also presented. Although the course emphasizes the descriptive and functional aspects of telecommunications technology and systems, a background in college-level algebra and calculus is helpful.

Part one consists of telecommunications network fundamentals, including FDM and TDM transmission techniques; mechanical, common control, and electronic-stored program-switching techniques; analog and digital switching systems; and Poisson and Erlang B traffic engineering fundamentals.

Part two involves a discussion of radio, cable, fiber, optic, waveguide, and satellite-transmission systems; subscriber apparatus, including PABXs, key systems and ACDs; test and maintenance procedures; digital communication systems; private switched network; and packet communications.

09.727 Introduction to Data Communications Systems

Offers participants an overview and introduction to the rapidly expanding data-communications field. The course provides an opportunity to gain practical insight and understanding of the terminology, design concepts, data-communications services, and various elements comprising the design of a data-communications system. Emphasis is placed on emerging trends in intelligent data networks, new forms of data communications, and relationships with teleprocessing and network organization.

Participation in the course assumes a general familiarity with data-processing systems. The course is structured to help meet the needs of EDP/teleprocessing/data-communications systems analysts, planners, decision makers, and others requiring knowledge of the development of telecommunications systems. Participants have an opportunity to acquire a working knowledge of the technology, building blocks, and types of systems used in data communications.

06.753 Data Communications Network Components

This course offers an in-depth look at the operation of various devices comprising modern data-communications networks. Discussion focuses on key selection criteria and cost-performance trade-offs, and will also cover transmission media and equipment, concentration and switching equipment, and special devices, including protocol converters and encryption devices. Background equivalent to 09.727 Introduction to Data Communications Systems is recommended.

03.771 Local Area Networks

This course introduces participants to the design configuration and implementation of Local Area Networks (LANs). Emphasis is placed on the practical integration of software elements, building upon the study of network architectures and protocols. Topics include the evolution of local-area computer networks, network topologies, layering of protocols, network media, baseband and broadband technologies, an overview of state-of-the-art network offerings, and an examination of future trends. Course 09.727 Introduction to Data Communications Systems or the equivalent is recommended background.

03.726 Optical Fiber Communications Systems

Recent advances in low-loss optical fibers and integrated optics have greatly expanded the use of optical systems in a wide variety of communications applications. This course, designed for communications systems designers and optical-systems applications engineers, presents the characteristics, as well as the underlying principles, of optical communications systems and components. Proper specification and use of light sources, fibers, photodetectors, and other system elements are discussed. Techniques for designing optical fiber communications systems are presented, and designs of several different types of systems are reviewed.

03.728 Satellite Communications

Intended for industry, university, government, and military technical personnel who desire an understanding of modern commercial and military satellite communications systems. The course covers the fundamentals of satellite communications, emphasizing the systems-engineering aspects. Fundamental concepts are stressed, with emphasis on understanding the various multiple-access/modulation/coding techniques, state-of-the-art satellite communications technology, interference rejection schemes, and future system trends. Participants should have a background or experience in the fundamentals of telecommunications.

49.750 Automated Office Systems

This course is designed to familiarize managers, telecommunications specialists, and administrative service specialists with the basics of planning and implementing the integration of the multitude of electronic equipment and systems that may evolve into the office of the future. Discussion ranges from the conceptual, including projections on the feasibility of various techniques in terms of productivity, industrial relations, and general management the-

ory to the practical, including implementation approaches, obsolescence, cost-effectiveness, and system payback. Topics include electronic and voice mail, teleconferencing, word processing, dictation, and computing facilities.

49.729 Systems Network Architecture

Introduction to the structure, capabilities, and evolution of Systems Network Architecture (SNA). An insight is presented regarding the relationship among SNA and new standards and technologies, including the ISO Reference Model for Open Systems Interconnection, local area networks, and x.21/x.25 public data network services. An objective view of SNA's strengths and weaknesses is presented.

The course presents the details of SNA's internal structure and operational characteristics, as well as a discussion of implementation issues. By presenting SNA in real-world situations, participants will have an opportunity to acquire an understanding of how SNA is actually used rather than examining the topic in strictly theoretical terms. A discussion of competitive SNA products and various IBM coexistence issues will be provided. The course concludes with future trends in Systems Network Architecture. Course 09.727 Introduction to Data Communications Systems or equivalent experience is recommended background.

49.726 Telecommunications Switching Systems

Step-by-step, panel, and crossbar systems are presented to illustrate the development of switch architectures. Stored-program analog and digital switches are also included. Discussion includes the technology; hardware architecture, including traffic considerations; and software architecture. PABXs, key systems, and packet switches are also addressed. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

03.721 Microwave Communications Systems

Important criteria involved in planning and engineering a microwave communications system are technically explained. Emphasis is placed on the microwave equipment and propagation characteristics. Bandwidth information rate, and simple consideration and spectra are discussed. The fundamentals of guided and unguided wave propagation are reviewed in preparation for calculations of path loss between terminals. The phenomena of refraction, reflectors, and ducting multipath are described. The effects of weather and fading are discussed with respect to diversity compensation. Antennas and other microwave devices are analyzed, and design methods indicated; modulation and coding are considered if time permits.

03.733 Microwave Components and Antennas

The underlying engineering design and operating principles of microwave components and antennas are presented, with emphasis on their functional aspects. The class is conducted using a lecture/workshop format, and work-related problems are solicited from participants. Topics include transmission lines, modal analysis, and use of Smith charts. Presentation of operating principles

and design procedures for rotary joints, diplexers, cavity filters, switches and couplers, dipoles and array antennas, reflector and optical antennas, horns, tracing antennas, and satellite RF systems is provided.

49.727 Teletraffic Engineering

Topics include the Poisson, Erlang B, Erlang C, Crommelin-Pollaczek and related traffic-engineering tables. Other considerations, such as overflow, peakedness, time-of-day routing, and network design, are discussed. Emphasis is placed on an understanding of the traffic model and problem solving. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

49.725 Transmission Techniques

Detailed discussion of analog and digital transmission techniques for subscriber loops and trunks. Included are radio, cable, satellite, and fiber-optic systems, as well as multiplexers. Engineering considerations, such as power budgets, noise buildup, and error rates, are also discussed. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

49.722 Integrated Services Digital Networks Workshop

The workshop offers students an opportunity to plan, design, procure, and install an ISDN for a hypothetical problem. Students are presented a model situation for which they must fully define the requirements, write specifications for the system, write a contract for system procurement, and schedule, in detail, the system's installation. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

Telecommunications Administration

49.720 Telecommunications Network Administration

Presents an overview of the fundamentals of telecommunications network administration, as distinguished from day-to-day operations. Discussion includes practical aspects of establishing and maintaining records and reports, including services, equipment, and software; financial considerations, including billing, economical justification for services or equipment, and cost/performance analysis; and system-planning considerations, including needs definition, manpower scheduling, and data analysis, as well as planning occasional special services. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

49.721 Telecommunications Regulations

The regulatory process, procedures, and environment are presented. Emphasis is on how this process affects the corporate user and how the corporate user can affect the regulatory process. Key FCC and state tariffs, emphasizing New England states, are discussed. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

49.723 Network Operations

The fundamentals of telecommunications network operations are discussed. Topics include fault detection and isolation, maintenance procedures and techniques, administrative requirements for trouble records, service orders, configuration management and control, and carrier interface requirements and procedures. Course 03.738 Principles of Telecommunications—Part II or the equivalent is recommended background.

49.724 System Procurement

A systematic approach to the procurement of complex systems in an increasingly sophisticated consumer environment. Topics include requirements definition, economic and technical constraints, preparation of the request for proposal, vendor and product evaluation, financial analysis, legal considerations, procurement methods, system integration, and postprocurement followup.



TECHNICAL MANAGEMENT

08.707 Modern Technical Management-Human Aspects

08.708 Modern Technical Management-Functional Aspects

Designed for managers or aspiring managers who are faced with the challenge of leading others in a technological environment and who seek greater effectiveness. The courses individually focus on the two basic dimensions of modern technical management. The first dimension deals with the human aspects of management and is concerned with the interaction of individuals, groups, and organizations. The second dimension is concerned with the functions that managers must perform in order to achieve their organizational objectives.

Both courses are conducted on a workshop basis, providing participants an opportunity to interact with others from various company environments. A framework for meaningful discussion is provided, offering participants an opportunity not only to learn about, but to internalize and apply, new management approaches in their personal work situations.

08.703 Technical Project Administration

Surveys the tools and techniques necessary to manage effectively and to control large-scale technical projects and programs. Topics include project identification, definition of project scope, project life-cycle and baseline management, network planning and scheduling, technical appraisal and performance measurement, cost-control systems, and configuration management.

08.709 Marketing Management for Technical Professionals

In today's competitive environment, a company cannot expect to achieve optimum performance without having a well-defined strategy to guide its decisions. This course provides an analysis of internal and external factors necessary to develop marketing strategy. Several new methods and conceptual frameworks are examined as means of integrating key considerations in the formulation of marketing strategy. Topics include analyzing the competitive environment, measuring company strengths and weaknesses, reviewing current products and markets, developing new strategic focuses, and formulating plans to implement strategies.

08.700 Finance for Technical Professionals

Provides technical personnel an appreciation and understanding of financial management. Designed to help eliminate confusion in financial terminology and to assist participants in developing an understanding of basic concepts as well as specific techniques in finance. Participants are encouraged to relate the financial function to their own specialties and to discuss the financial implications of their decisions. No prior knowledge of accounting and finance is required.

29.798 Seminar in Innovation and Problem Solving

Designed to offer students an opportunity to develop improved on-the-job performance in innovation and problem solving. Various approaches to creativity, innovation, and problem solving

are explored and practiced, including operational techniques such as idea generation, brainstorming, and didactic routines that stimulate and promote individual and group creative capabilities. In the course, innovation and problem solving are presented as learnable processes covered from both the theoretical and practical points of view. Pertinent information from medical and psychological literature is introduced, and applicable research results are presented and discussed. Participants are encouraged to submit job-related problems as case studies for class consideration. Homework and special out-of-class projects are assigned.

29.775 Seminar in Technical Report Writing

Designed for the technical professional seeking to improve written communication skills. The course offers participants an opportunity to present and write ideas and information more confidently and accurately for various types of technical reports and publications.

29.799 Seminar in Effective Speaking Skills

Designed for the technical professional seeking to improve verbal communication skills frequently encountered in business situations. The course provides an opportunity for participants to present and discuss ideas and information more confidently and convincingly on a person-to-person basis and in small groups such as design and review committees and symposia. Conducted as a workshop, the course adopts an in-depth, how-to approach, emphasizing directly applicable verbal communication techniques. Course participants have an opportunity to learn to assess and accept their verbal communication strengths and weaknesses and to build on them successfully.

08.766 Quality Improvement Programs

Broad quality improvement programs, such as quality circles and quality costs, are rapidly gaining momentum with proven success. Advanced formal techniques incorporate the respective functions of design, purchasing, production, and marketing. This course presents motivation and group dynamics, including the Herzburg, Maslow, McGregor, Hawthorne, and Taylor theories. Definitions of quality productivity, program terms, and management commitment lead into policy statements, program responsibility, and financial investment. Beginning with the foundation of a healthy employee and financial environment, the course concludes with a treatment of quality circles, encompassing origin, previous socioeconomic boundaries, program organization; training of facilitators, leaders, and participants; maintaining momentum, and long-term tangible benefits.

07.753 Industrial Safety Management

Provides instruction in the techniques required to implement an industrial loss-prevention program. The course offers participants an opportunity to broaden their understanding of industrial hazards and their effects on workers and their company. Participants are informed of the most recent developments in the operation of OSHA. The course offers material that may help

companies comply with OSHA standards and regulations and deal with problems arising from the growing complexity of modern production methods. New safety-training techniques that can be used in on-the-job safety training are presented. The team approach to industrial safety is emphasized.

08.701 Product Liability and Safety

This practical course offers day-to-day applications for safety, production, design, sales, service, quality control, engineering, and management personnel. The basic subject matter of the course concerns principles and techniques of evaluation and control of product liability exposure for manufacturers, distributors, sales, and service organizations. Workshop sessions, in which participants examine problems of their own particular interest, are planned.

08.705 Principles of Product Assurance

Participants are offered instruction in the underlying principles and techniques required to implement modern product-assurance programs. Embracing the fields of reliability, maintainability, quality control, product test, and product evaluation, the course offers exposure to the most recent proven reliability and quality at a reasonable cost. A broad treatment of the methods used for detection, correction, and avoidance of design and production deficiencies is offered. The course material extends to phases of industrial operations, from research and development through large-scale manufacturing activities. A familiarity with basic probability and statistics is required. Technical treatment of the material is balanced by discussions of actual cases.

08.730 Procurement and Vendor Quality Assurance

Recommended for professionals involved in any aspect of procurement activities, particularly in the electronics industry. The course surveys the vendor/customer relationship from the section process to final delivery of product, emphasizing quality assurance techniques. The systems, documents, and activities required in the procurement process are developed and analyzed. Topics include specifications, contracts and agreements, conducting a vendor survey, rating systems, inspection, issues in multinational procurement, and dealing with problem suppliers. Leading quality-assurance practitioners, including Juran, Deming, Crosby and Japanese successes, are evaluated.

08.710 Legal and Business Aspects of Innovation

Designed to help improve middle- and upper-level managers' understanding of legal and business principles applicable to the procurement or licensing of rights in intellectual property. Participation in the course can help provide participants an insight into the value of patents, trade secrets, copyrights, and trademarks, and offer them an opportunity to acquire knowledge necessary for early recognition of potential legal problems associated with the protection and purchase of such rights.

08.711 Sales Skills for Technical Professionals

A hands-on course designed for persons faced with real-world problems of selling, planning, and implementing for both pros-

pects and inside associates. Instruction is offered in the techniques of opening a conversation; and probing to find facts, needs, problems, idiosyncracies, and prejudices. Students have an opportunity to familiarize themselves with how to relate benefits to features, present solutions, and to close. The course helps participants to identify personal goals and translate them into beneficial planning techniques, follow-up, and organization procedures to achieve results.

08.750 Advanced Program Management

High-technology programs are complex and multifaceted, requiring special approaches, methods, and systems. This course examines the specifics of managing complex projects and programs. The role of the project/program manager as a team leader is highlighted, in addition to important techniques for effectively controlling costs and schedules, and improving performance. The course is intended to help provide an advanced working knowledge of project management for professionals who plan, organize, and direct high-technology projects and programs for industrial, governmental, or institutional organizations.

Lectures, case studies, and business games are combined in the course to complement working knowledge and help develop leadership and skills needed by program managers in today's competitive market. Features of the course include a case study on effective engineering program control, in-class exercise on managing a large proposal development, group exercise on team building, and a group simulation exercise in dealing with conflicts. Specially developed audiovisual presentations and student workbooks are also included.

08.751 New Product Development

This series of workshops focuses on the trends and concepts of new-product planning, development, evaluation, and marketing. The program is designed to help enhance a manager's ability to establish, evaluate, or improve new product development and marketing programs within an organization. The workshop faculty includes executives from a broad spectrum of industrial specialties who provide a comprehensive treatment of the practices required to bring a new product to market.

05.751 Material Requirements Planning

Material Requirements Planning (MRP) has revolutionized modern manufacturing operations. A successful MRP program helps control production, reduce inventories, and improve capacity planning. This course is designed for buyers, purchasing managers, materials planners and schedulers, production and inventory-control managers, and transportation and distribution specialists. Topics include the components of MRP-II, data-base requirements, feasibility determination, and keys to successful management implementation.

08.763 Software Project Management

Designed to introduce the tools and techniques useful in managing large-scale programming efforts. Topics include the software-development cycle and top-down development, problem analysis,

project planning, structured programming, team organization, specifications and documentation, testing, installation and maintenance, and program evaluation. Recommended for programmers, systems analysts, and managers. Experience in software development is presumed.

08.764 Technological Forecasting

Emphasizes the application of research-based methods in predicting the consequences of changes in economic and technological conditions. Designed for research and development, marketing, finance, and planning managers who have responsibility for making decisions based upon technical and economic movements. Topics include forecasts in strategic planning, Delphi methods, trend analysis, model building, environmental analysis, product life cycle, and contingency planning.

08.765 Practicum in Technical Management

The practicum is the capstone of the Technical Management Program. Participants select a project related to their own work experience and complete a substantial report, drawing upon concepts acquired in the core curriculum and elective sequence.

COURSE INDEX

Introduction to Computers

- 09.785 Introduction to Computers for Managers and Professionals 21
- 09.775 The Personal Computer Revolution 21

Microcomputer Systems

- 03.749 Introduction to Microcomputer Systems 21
- 03.757 8-Bit Microprocessor Systems: The Z-80 Family 21
- 03.792 16-Bit Microprocessor Systems: The 8088/8086 Family 22
- 03.793 16-Bit Microprocessor Systems: The 68000 Family 22
- 03.780 High-Integration Microprocessors 22
- 09.771 Microcomputer Interfacing and Bus Structures 22
- 03.766 Microcomputer Operating Systems 22
- 03.794 Microcomputer Communications and Networking 23
- 03.702 Bit-Slice Microcomputer Design: Part I 23
- 03.742 Bit-Slice Microcomputer Design: Part II 23

Computer Automation

- 09.734 Computerized Process Control 23
- 09.786 Introduction to CAD/CAM Technology 24
- 09.737 Advanced CAD/CAM Workshop 24
- 03.722 Data-Acquisition Systems 24
- 05.750 Advances in Manufacturing Technologies 24

Artificial Intelligence and Robotics

- 05.720 Introduction to Artificial Intelligence 25
- 05.721 LISP Programming in Artificial Intelligence 25
- 05.701 Pattern Recognition and Robotics 25
- 05.722 Machine Vision and Manipulation 25
- 05.723 Industrial Robotics Technology 25
- 05.752 Speech Synthesis and Recognition 26
- 05.753 Knowledge Engineering 26

Digital Computer Technology

- 09.744 Principles of Digital Logic Design 26
- 03.759 Interactive Computer Graphics 26
- 09.790 Design of Fault-Tolerant Digital Systems 27
- 03.791 Video Graphic Display Technology 27
- 09.791 Array Processors in Digital Signal Processing 27
- 09.792 EMI Control in EDP Equipment 27
- 09.794 Advances in Computer Architecture 27

Software Engineering

- 09.730 Software Engineering for Hardware Designers 28
- 09.726 Design of Computer Operating Systems 28
- 09.743 Computer Microprogramming and Emulation 28
- 06.750 Data-Base Systems Concepts 28
- 06.754 Logical Data-Base Design 29
- 06.755 Physical Data-Base Design 29
- 09.747 Software Verification and Validation 29
- 29.715 Software Documentation and Manual Preparation 29
- 09.781 The UNIX Operating System 29

- 09.748 Principles of Software Reliability 30
- 09.783 Software Engineering Economics 30

Programming Languages

- 09.782 C Programming Language 30
- 09.780 ADA Programming Language 30
- 09.745 Programming and Problem Solving with PASCAL 31
- 09.746 Advanced Programming Techniques with PASCAL 31

Assembler Language

- 09.770 Z-80 Assembler Language Programming 31
- 09.784 PDP-11 Assembler Language Programming 31

Personal Computers

- 09.795 Inside the Apple: An Engineer's View 32
- 09.796 The IBM Personal Computer 32
- 09.797 The TRS-80 Personal Computer and BASIC 32

Semiconductor Science

- 03.772 Introduction to Solid-State Principles 35
- 03.773 Principles of Semiconductor Devices 35
- 03.754 Semiconductor Optoelectronics I: Photodetectors 35
- 03.755 Semiconductor Optoelectronics II: Lasers and Emitters 35
- 01.751 Crystal Growth and Characterization 36
- 03.710 Microwave Semiconductor Engineering 36

Microelectronics

- 03.774 Integrated Circuit Fabrication 36
- 03.713 Advances in Submicron Fabrication Techniques 36
- 03.769 Custom VLSI Design 36
- 03.711 Advanced Custom VLSI Design Workshop 37
- 03.765 VLSI Gate Array Design 37
- 03.799 Microelectronic Interconnection and Packaging 38
- 03.778 Microelectronic Testing and Quality Assurance Techniques 38

Systems Theory and Design

- 09.722 System Reliability Engineering 41
- 09.773 Design Practices in System Maintainability 41

Communications Theory

- 03.700 Principles of Communications Theory 41
- 09.712 Digital Signal Processing 41
- 03.743 Applications of Digital Signal Processing 42
- 03.730 Detection of Signals in Noise 42
- 03.732 Digital Modulation Techniques 42
- 49.793 Coding and Information Theory 43

Telecommunications Systems Technology

- 03.737 Principles of Telecommunications: Part I 43
- 03.738 Principles of Telecommunications: Part II 43
- 09.727 Introduction to Data Communications Systems 43
- 06.753 Data Communications Network Components 44
- 03.771 Local Area Networks 44
- 03.726 Optical Fiber Communications Systems 44

- 03.728 Satellite Communications 44
- 49.750 Automated Office Systems 44
- 49.729 Systems Network Architecture 45
- 49.726 Telecommunications Switching Systems 45
- 03.721 Microwave Communications Systems 45
- 03.733 Microwave Components and Antennas 45
- 49.727 Teletraffic Engineering 46
- 49.725 Transmission Techniques 46
- 49.722 Integrated Services Digital Networks Workshop 46

Telecommunications Administration

- 49.720 Telecommunications Network Administration 46
- 49.721 Telecommunications Regulations 46
- 49.723 Network Operations 47
- 49.724 System Procurement 47

Technical Management

- 08.707 Modern Technical Management—Human Aspects 49
- 08.708 Modern Technical Management—Functional Aspects 49
- 08.703 Technical Project Administration 49
- 08.709 Marketing Management for Technical Professionals 49
- 08.700 Finance for Technical Professionals 50
- 29.798 Seminar in Innovation and Problem Solving 50
- 29.775 Seminar in Technical Report Writing 50
- 29.799 Seminar in Effective Speaking Skills 50
- 08.766 Quality Improvement Programs 50
- 07.753 Industrial Safety Management 51
- 08.701 Product Liability and Safety 51
- 08.705 Principles of Product Assurance 51
- 08.730 Procurement and Vendor Quality Assurance 51
- 08.710 Legal and Business Aspects of Innovation 52
- 08.711 Sales Skills for Technical Professionals 52
- 08.750 Advanced Program Management 52
- 08.751 New Product Development 52
- 05.751 Material Requirements Planning 53
- 08.763 Software Project Management 53
- 08.764 Technological Forecasting 53
- 08.765 Practicum in Technical Management 53

FACULTY

- Martin Agulnek, Ph.D.
 Polaroid Corporation
 Computer Engineering
 Robert W. Akerley, M.S.
 Prime Computer
 Computer Engineering
 Michael Amicone, M.S.
 New England Telephone
 Company
 Telecommunications
 M. Louis Arin, Ph.D.
 Consultant
 Computer Engineering
 Robert C. Babbit, M.S., P.E.
 Stone & Webster Engineering
 Corp.
 Technical Management
 Mohammad M. Bari, M.S.E.E.
 Digital Equipment Corporation
 Computer Engineering
 Paul C. Barr, Ph.D.
 Aetna Telecommunications
 Laboratory
 Computer Engineering
 Morton Berlan, M.B.A.
 Massachusetts Institute of
 Technology
 Telecommunications
 Steven L. Bernstein, Engineers
 Degree
 MIT Lincoln Laboratories
 Telecommunications
 David Bliss, Ph.D.
 Mircowave Associates
 Semiconductor Science
 Richard Borgioli, M.S.E.E.
 CSPI
 Computer Engineering
 David R. Bourgeois, B.S.E.E.
 Honeywell
 Computer Engineering
 Jeffry M. Bram, B.E.E.
 Raytheon Company
 Computer Engineering
 William T. Brandon, M.S.E.E.
 MITRE Corporation
 Systems Engineering
 Telecommunications
 Ronald O. Brown, Ph.D.
 GTE Telecommunications
 Systems, Inc.
 Telecommunications
 G. William Carter III, B.S.E.E.
 GTE Sylvania
 Telecommunications
 Christopher J. Cassidy, M.S.
 Data General Corporation
 Computer Science
 Adrian J. Cogan, Ph.D.
 GTE Laboratories
 Telecommunications
 Garrett T. P. Cavanaugh, M.S.
 Telesis Corporation
 Computer Engineering
 Michael S. Cogan, M.S.E.E.
 Modern Systems Consulting
 Computer Engineering
 Albert M. Colella, Ph.D.
 United States Naval Underwater
 Systems Center
 Systems Engineering
 Howard Cravis, M.A.
 Arthur D. Little, Inc.
 Telecommunications
 Mark L. Dakss, Ph.D.
 GTE Laboratories
 Systems Engineering
 Ralph E. DeMent, B.E.E.
 Digital Equipment Corporation
 Telecommunications
 James Duca, B.S.E.E.
 Nixdorf Computer Corporation
 Computer Engineering
 John P. Ferrara, M.B.A.
 Digital Equipment Corporation
 Computer Engineering
 Alan S. Finger, B.S.E.E.
 Comprehensive Computer
 Consultants, Inc.
 Computer Engineering
 Roger L. Freeman, M.S.
 Raytheon Company
 Telecommunications
 Jonathan D. Fridman, M.S.E.E.
 MITRE Corporation
 Systems Engineering
 Lionel Friedman, Ph.D.
 GTE Laboratories
 Semiconductor Science
 John E. Fulenwider, Ph.D.
 Arthur D. Little, Inc.
 Systems Engineering
 Gustave R. Gaschnig, M.S.M.E.
 Raytheon Company
 Computer Engineering

- Theodore F. Gautschi, Ph.D.
Bryant College
Technical Management
- Peter J. George, B.S.E.E.
Fairchild Semiconductor
Computer Engineering
- Joseph L. Golden, B.A.
New England Telephone
Company
Telecommunications
- Charles D. Havener, M.S.E.E.
GenRad, Inc.
Computer Engineering
- Charlene R. Hayden, M.S.E.
GTE Systems Division
Computer Science
- Joseph P. Hayes, B.B.A.
Royal Business Group
Technical Management
- John D. Hays, B.S.
United States Air Force
Geophysics Laboratory
Computer Engineering
- Glenn R. Hearn, M.S.E.E.
MITRE Corporation
Microelectronics
- Ernest E. Hollis, M.S.E.E.
Sanders Associates
Microelectronics
- Patricia A. Horne, M.Ed.
Wang Laboratories
Computer Science
- Bruce A. Hunter, B.S.M.E.
Raytheon Company
Computer Engineering
- Kevin Ilsen, M.S.E.
MITRE Corporation
Computer Engineering
- Richard A. Jarrett, M.S.M.E.
Consultant
Assembler Language
- Clarence C. Joh, Ph.D.
Tufts University
Communications Engineering
- Mohsen Kavehrad, Ph.D.
Bell Laboratories, Inc.
Systems Engineering
- Christine L. King, B.A.
GTE Atlantic Operation
Telecommunications
- Gregory W. Koss, B.S.
Computer Devices Inc.
Computer Engineering
- Steven Kramer, M.S.
MITRE Corporation
Computer Engineering
- Melvin B. Langbort, M.B.A.,
C.P.A.
Melvin B. Langbort & Company
Technical Management
- James I. Levine, M.S.E.E.
Massachusetts Institute of
Technology
Computer Engineering
- Donald A. Lewine, B.S.E.E.
Digital Equipment Corporation
Computer Engineering
- Kurt J. Linden, Ph.D.
Laser Analytics
Semiconductor Science
- Shyan-Shiang Liu, Ph.D.
GTE Laboratories, Inc.
Communications Engineering
- Norman R. Mancuso, Ph.D.
Dennison Manufacturing
Company
Computer Engineering
- Herbert J. Marin, M.S.E.E.
Codex Corporation
Telecommunications
- John Masciola
GenRad, Inc.
Computer Science
- Joseph A. McGillivray, B.S.
GTE Sylvania
Telecommunications
- Thomas McPhee, M.S.C.S.
Digital Equipment Corporation
Computer Science
- John Melngailis, Ph.D.
Massachusetts Institute of
Technology
Microelectronics
- Joseph A. Messina, B.S.
Western Electric Company
Computer Engineering
- Henry Minden, Ph.D.
Sperry Research Center
Semiconductor Science
- Steven A. Mittleman, Ph.D.
Sperry Research Center
Semiconductor Science
- James K. Montrose, M.S.E.E.
CODEX Corporation
Telecommunications
- Stephen A. Moro, M.S.E.E.
Digital Equipment Corporation
Microelectronics
- J. Victor Nahigian, B.S.
Systems Analysis Services, Inc.
Computer Science

David M. Nathanson, M.S.
MIT Lincoln Laboratories
Semiconductor Science

Charles F. Newcomb, B.A.
W. J. Schaffer
Computer Engineering

John J. O'Donnell, Ph.D.
Signix Corporation
Systems Engineering

Kyriacos Orphanides, M.S.
Augat Isotronics
Semiconductor Science

James Paradise, B.A.
Artificial Intelligence
Corporation
Computer Engineering

Philip F. Paul, B.A.
Management Consultants
Technical Management

Bob J. Ravenstein, B.S.E.E.
BOMARA Associates
Computer Engineering

Stephen E. Rehn, B.S.
Panametrics
Computer Engineering

Leo R. Reynolds, J.D.
Hamilton, Brook, Smith and
Reynolds
Technical Management

William Rhodes, Ph.D.
GTE Laboratories
Semiconductor Science

Joseph G. St.Onge, B.S.E.E.
Wang Laboratories
Computer Engineering

John Schlafer, M.S.E.E.
GTE Laboratories
Systems Engineering

Charles H. Sides, Ph.D.
Massachusetts Institute of
Technology
Technical Management

Jeff R. Siegel, M.S.E.E.
General Cognition Corporation
Computer Engineering

Joseph R. Smyjunas, B.S.
Wang Laboratories
Telecommunications

Alan W. Swanson, Ph.D.
Gould Corporation
Semiconductor Science

Hans J. Thamhain, Ph.D.
Worcester Polytechnic Institute
Technical Management

Satish M. Thattee, Ph.D.
Texas Instruments, Inc.
Semiconductor Science

Natalie Wallace, M.M.T.
AVCO
Computer Engineering

Patrick S. Wang, Ph.D.
Wang Laboratories
Computer Engineering

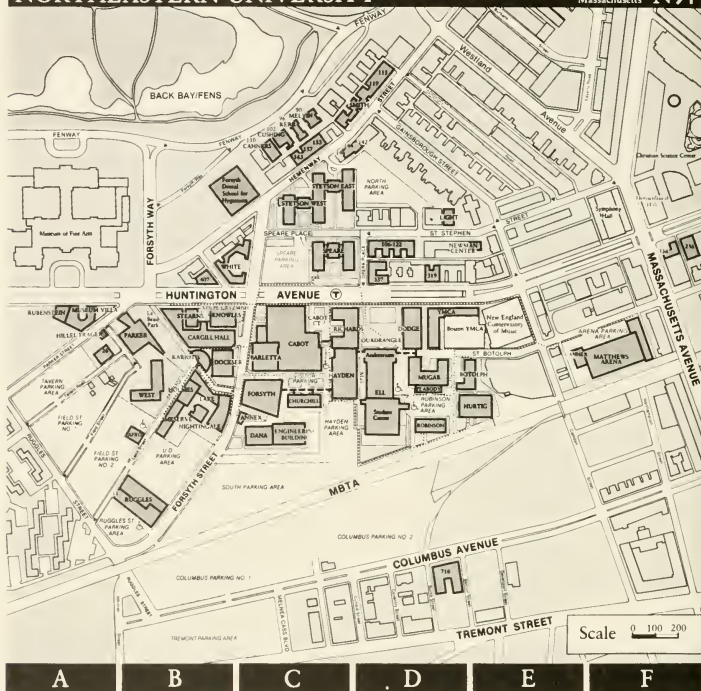
Clifford Weiss, B.S., B.A.
Digital Equipment Corporation
Telecommunications

Marvin M. Wurtzel, M.S.E.M.
Prime Computer, Inc.
Technical Management

NORTHEASTERN UNIVERSITY

Boston
Massachusetts

N 7



Academic and Service Buildings

African-American Institute
Barletta Natatorium
Boston YMCA
Boroloff Building
Cabot Physical Education Building
Cahners Hall
Cargill Hall
Churchill Hall
716 Columbus Avenue
Cushing Hall
Dodge Library
Dana Research Center
Docker Hall
Ell Student Building (Auditorium)
Ell Student Center (Student Lounge)
Engineering Building
Forsyth Building
Forsyth Building Annex
Hayden Hall
Hillel-Frager
Holmes Hall
236 Huntington Avenue

B Hurtig Hall
B Kariotis Natatorium
D.E. Kerr Hall (Faculty Center)
D.E. Knowles Center (Gryzmish Hall)
C Knowles Center (Volpe Hall)
C Lake Hall
B 334 Massachusetts Avenue
C Matthews Arena
D Matthews Arena Annex
C Meserve Hall
C Mugar Life Science Building
C Peabody Health Professions Center)
D Newman Center
D Nightingale Hall
D Parker Building
C Peabody Center
C Richards Hall
B Rugles (11 Leon Street)
C Robinson Hall
A 122 St. Stephen Street
B Stearns Center
F 26 Tavern Road

Key

Academic, Residential,
and Service Buildings
Handicapped Parking
Handicapped Routes
Parking Areas
Public Buildings
Public Parks
Street Direction
Underground Tunnel

Maps are provided by the
Visitor Information Center,
115 Richards Hall, extension 2736.
Some buildings on this map are used but
not owned by Northeastern University
12.50.2.RV 6/83

Boston Campus



Center for Continuing Education, Dedham



Suburban Campus and Burlington High School



Chelmsford High School



Framingham North High School



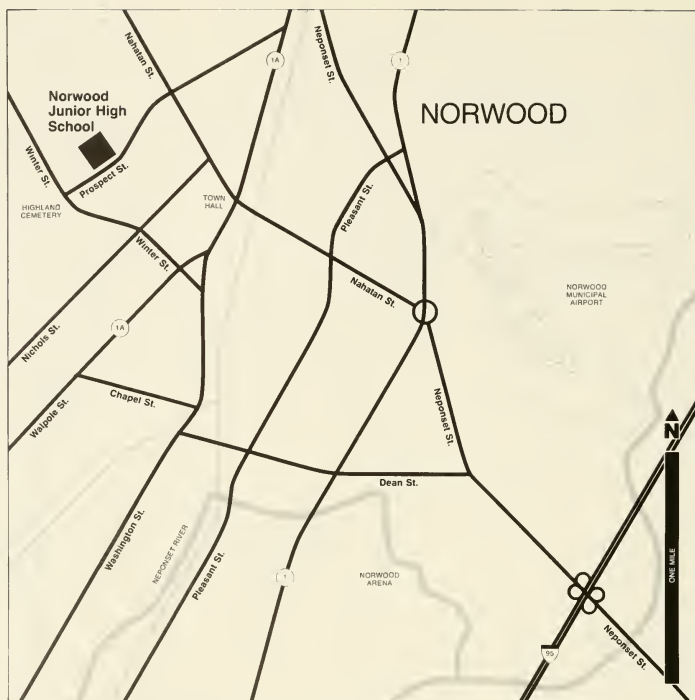
Lexington (Minuteman Vocational High School)



Marlborough High School



Milford High School



Norwood Junior High School North



Weston (Henderson House)

University College
Part-Time Programs
1983–1984

August Issue

Northeastern University Bulletin



NEW ENGLAND
ASSOCIATION
OF SCHOOLS
AND COLLEGES
ACCREDITED MEMBER

Part-time day and evening
undergraduate programs in:

Arts and Sciences

Business Administration

Health Professions

Law Enforcement

The Northeastern
University Bulletin
(USPS-989-040)
is issued at
360 Huntington Avenue,
Boston, Massachusetts 02115,
six times a year:
once in January,
twice in August,
once in September,
and twice in October.
Second class postage paid at
Boston, Massachusetts.

Volume XI,
Number 2,
August 15, 1983.

POSTMASTER—Send address changes to:
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115
617-437-2400

Published by Northeastern
University Publications 3.27.3

Cover photo of Boston skyline by Leslie Flores.

Delivery of Services The University assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements, and acts of public authorities. The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities, or performance, but its inability or failure to do so shall not subject it to liability.

The Northeastern University catalog contains *current information* regarding the University calendar, admissions, degree requirements, fees, and regulations, and such information is not intended to be and should not be relied upon as a statement of the University's contractual undertakings.

Northeastern University reserves the right in its sole judgment to promulgate and change rules and regulations and to make changes of any nature in its program, calendar, admissions policies, procedures and standards, degree requirements, fees, and academic schedule whenever it is deemed necessary or desirable, including, without limitation, changes in course content, the rescheduling of classes, cancelling of scheduled classes and other academic activities, and requiring or affording alternatives for scheduled classes or other academic activities, in any such case giving such notice as is reasonably practicable under the circumstances.

We at Northeastern will do our best to make available to you the finest education we can provide, the most stimulating atmosphere in which to learn, and the most congenial conditions under which you may enjoy the learning experience. But the quality and the rate of progress of your academic career is in large measure dependent upon your abilities, commitment, and effort. You will be a full participant in an educational partnership. We will and, indeed, can only make the opportunities available to you; it is up to you to take advantage of them.

This is equally true with your career upon graduation. We cannot guarantee that you will obtain any particular job; that will depend upon your own skills, achievement, presentation, and other factors such as market conditions at that time. Similarly, in many professions and occupations there are increasing requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These may change during the period of time when you are at Northeastern and may vary from state to state. While we are ready to help you find out about these requirements and changes, it is your responsibility to initiate the inquiry because we cannot know what your expectations and understandings are unless you tell us.

In brief, what we are saying to you is that we are here to offer you educational opportunities and choices and to assist you in finding the direction in which you want to steer your educational experience. But you are a partner in this venture with an obligation and responsibility to yourself.

Equal Opportunity Policy Northeastern University is committed to a policy of providing equal opportunity to all. In all matters involving admissions, registration, and all official relationships with students, including evaluation of academic performance, the University insists on a policy of nondiscrimination.

Northeastern University is also an equal opportunity employer; it is institutional policy that there shall not be any discrimination against any employee or applicant for employment because of race, color, religion, sex, age, national origin, or on the basis of being a handicapped, but otherwise qualified, individual. Further, Northeastern will not condone any form of sexual harassment.

Inquiries concerning our equal opportunity policies may be referred to the University Title IX Coordinator/ Compliance Officer for Section 504 of the Rehabilitation Act of 1973, Affirmative Action Office, 175 Richards Hall, 617-437-2133.

Family Educational Rights and Privacy Act In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records whenever appropriate and to challenge specific parts of them when they feel it necessary to do so.

Office of Services for the Handicapped The Office of Services for the Handicapped (OSH) provides a variety of support services and general assistance to all of Northeastern's disabled students and employees. The University's efforts to comply with the Rehabilitation Act of 1973 are coordinated by Ruth Bork, OSH director, 5 Ell Center, (617) 437-2675.

Emergency Closing of the University Northeastern University has made arrangements to notify students, faculty, and staff by radio when it becomes necessary to cancel classes because of extremely inclement weather. Radio stations WBZ, WEEI, WHDH, WHUE, WJDA, WCOZ-FM, WRKO, WKOX, WHAV, WVBF-FM, WNTN, WCAS, WBOS, WXKS, WROR, WILD, WRBB, WFNX, WBCN, and WLLH will announce the University's decision to close. Many University College classes meet in public and private schools. It may happen, therefore, that some satellite locations will be forced to close while others will not. When listening to radio announcements, students are advised to note the status of classes at their particular location.

Disclaimer Tuition rates, all fees, rules and regulations, and courses and course content are subject to revision by the President and the Board of Trustees at any time.

Accreditation Northeastern University is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states. Accreditation by the Association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators.

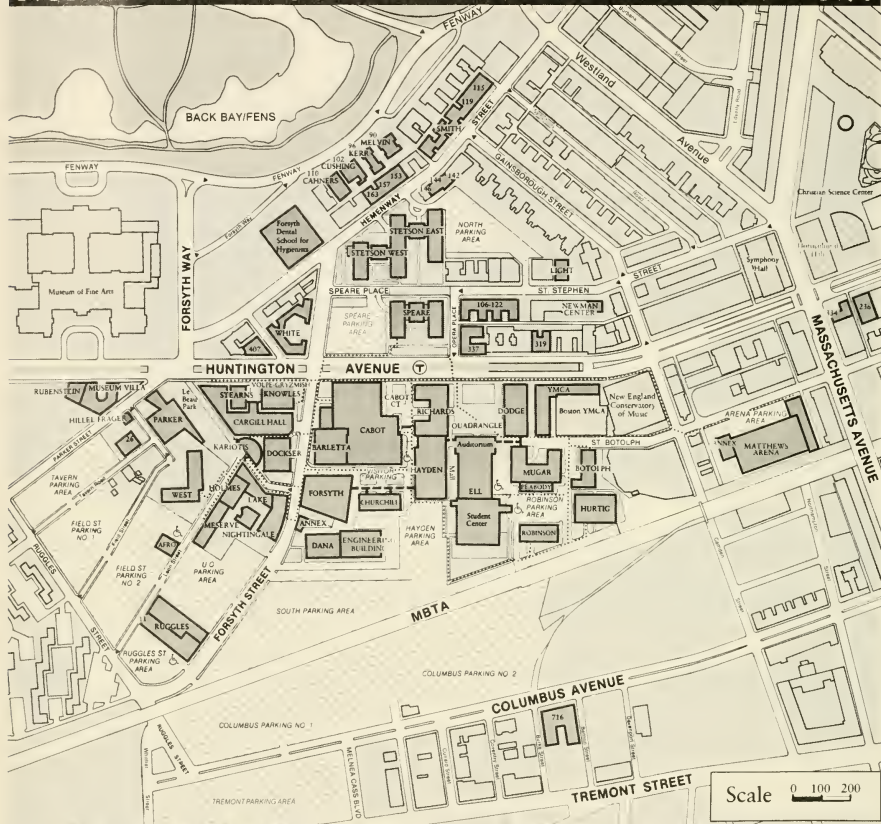
Contents

- 4 Boston Campus Map
- 5 University College Offices
- 6 Academic Calendar
- 9 The University
- 17 Buildings and Facilities
- 21 University College
- 25 Office of Academic and Student Affairs
- 26 Academic Policies
- 34 Career and Academic Counseling Services
- 37 Tuition and Fees
- 39 Scholarships and Financial Aid
- 43 Student Activities
- 45 Programs of Study
- 47 Business Administration
- 67 Arts and Sciences
- 93 Law Enforcement
- 109 Health Professions Programs
- 131 Certificate Programs
- 139 Computer Systems Specialist Program
- 141 Course Descriptions
- 219 Faculty
- 236 Governing Boards and Officers
- 241 Maps
- 256 Index

NORTHEASTERN UNIVERSITY

Boston
Massachusetts

N7



Scale 0 100 200

A

B

C

D

E

F

Academic and Service Buildings

African-American Institute
Barletta Natatorium
Boston YMCA
Botolph Building
Cabot Physical Education Building
Cahners Hall
Cargill Hall
Churchill Hall
716 Columbus Avenue
Cushing Hall
Dodge Library
Dana Research Center
Dockser Hall
Ell Student Building (Auditorium)
Ell Student Center (Student Lounge)
Engineering Building
Forsyth Building
Forsyth Building Annex
Hayden Hall
Hillel-Frager
Holmes Hall
236 Huntington Avenue

B Hurst Hall
B Kariotis Hall
DE Kerr Hall (Faculty Center)
DE Knowles Center (Gryzmish Hall)
C Knowles Center (Volpe Hall)
C Lake Hall
C 334 Massachusetts Avenue
C Matthews Arena
C Matthews Arena Annex
C Meserve Hall
C Mugar Life Science Building
C (Peabody Health Professions Center)
B Newman Center
D Nightingale Hall
D Parker Building
C Peabody Center
C Richards Hall
C Ruggles (11 Leon Street)
C Robinson Hall
A 122 St. Stephen Street
B Stearns Center
F 26 Tavern Road

DE
B
C
B
B
B
F
F
EF
B
D
D
DE
B
B
D
C
AB
D
D
B
A

Key

Academic, Residential,
and Service Buildings
Handicapped Parking
Handicapped Routes
Parking Areas
Public Buildings
Public Parks
Street Direction
Underground Tunnel



Maps are provided by the
Visitor Information Center,
115 Richards Hall, extension 2-746.
Some buildings on this map are used but
not owned by Northeastern University.
12.50.2 RV 6.83

University College Offices

Office for General Information	437-2400	102 Churchill Hall
Office of the Registrar	437-2314	120 Hayden Hall
Burlington Campus	272-5500	
Burlington (High School)	273-1870	
Belmont Campus	484-4418	
Brockton Campus	584-2444	
Chelmsford Campus	251-8792	
Dedham Campus	329-8000	
Framingham Campus	877-2333	
Lynnfield Campus	334-6027	
Marlborough Campus	485-4122	
Marshfield Campus	837-1835	
Milford Campus	473-2565	
North Attleboro Campus	695-9681	
Norwood Campus	769-4926	
Revere Campus	289-8113	
Westwood Campus	329-3030	
Weymouth Campus	335-9112	

Regular Office Hours

Boston		
120 Hayden Hall	Monday-Thursday	8:30 a.m.-8:00 p.m.
	Friday	8:30 a.m.-4:30 p.m.
102 Churchill Hall	Monday-Friday	8:30 a.m.-8:30 p.m.
	Saturday	8:30 a.m.-1:00 p.m.
Burlington (Suburban Campus)	Monday-Friday	8:00 a.m.-10:00 p.m.
	Saturday	8:00 a.m.-1:00 p.m.
Burlington (High School)	Monday-Thursday	5:30-10:00 p.m.
Belmont High School	Tuesday & Thursday	5:30-10:00 p.m.
Brockton High School	Monday & Wednesday	5:30-10:00 p.m.
Chelmsford High School	Tuesday & Thursday	5:30-10:00 p.m.
Dedham Campus	Monday-Friday	8:00 a.m.-10:00 p.m.
	Saturday	8:00 a.m.-1:00 p.m.
Framingham North High School	Monday-Thursday	5:30-10:00 p.m.
Lynnfield Middle School	Tuesday & Thursday	5:30-10:00 p.m.
Marlborough High School	Monday & Wednesday	5:30-10:00 p.m.
Marshfield High School	Tuesday & Thursday	5:30-10:00 p.m.
Milford High School	Tuesday	5:30-10:00 p.m.
North Attleboro High School	Monday & Wednesday	5:30-10:00 p.m.
Norwood Junior High School	Monday-Wednesday	5:30-10:00 p.m.
Revere (Abraham Lincoln School)	Tuesday & Thursday	5:30-10:00 p.m.
Westwood High School	Monday, Tuesday & Thursday	5:30-10:00 p.m.
Weymouth North High School	Monday-Thursday	5:30-10:00 p.m.

Summer Office Hours

Boston		
120 Hayden Hall	Monday-Thursday	8:30 a.m.-8:00 p.m.
	Friday & Saturday	Closed
102 Churchill Hall	Monday-Thursday	8:30 a.m.-8:30 p.m.
	Friday & Saturday	Closed

Burlington Suburban Campus	Monday-Thursday	8:00 a.m.-10:00 p.m.
	Friday & Saturday	Closed
Dedham Campus	Monday-Thursday	8:30 a.m.-10:00 p.m.
	Friday	8:30 a.m.-4:30 p.m.
	Saturday	Closed
Framingham North High School	Monday & Wednesday	5:30-10:00 p.m.
Marshfield High School	Tuesday & Thursday	5:30-10:00 p.m.

1983–1984 Academic Calendar

Fall Quarter 1983

Classes Begin Monday, September 26, 1983

Fall Registration Dates

Boston	5:30-8:00 p.m. 9:00-12 noon 5:30-8:00 p.m.	Tuesday-Friday, September 6–9 Saturday, September 10 Monday-Wednesday, September 12-14
Burlington	5:30-8:00 p.m. 12:00-3:00 p.m. and 5:30-8:00 p.m.	Monday & Wednesday, September 12 & 14 Tuesday, September 13
Belmont H.S.	5:30-8:00 p.m.	Thursday, September 8 and Tuesday, September 13
Brockton H.S.	5:30-8:00 p.m.	Wednesday, September 7 and Monday, September 12
Chelmsford H.S.	5:30-8:00 p.m.	Thursday, September 8 and Tuesday, September 13
Dedham Campus	5:30-8:00 p.m.	Wednesday, September 7 and Monday, September 12
Framingham North H.S.	5:30-8:00 p.m.	Tuesday, September 6 and Monday, September 12
Lynnfield Middle School	5:30-8:00 p.m.	Thursday, September 8 and Tuesday, September 13
Marlborough H.S.	5:30-8:00 p.m.	Wednesday, September 7 and Monday, September 12
Marshfield H.S.	5:30-8:00 p.m.	Thursday, September 8 and Tuesday, September 13
Milford H.S.	5:30-8:00 p.m.	Tuesday, September 6 and Tuesday, September 13
North Attleboro H.S.	5:30-8:00 p.m.	Wednesday, September 7 and Monday, September 12
Norwood Jr. H.S. North	5:30-8:00 p.m.	Wednesday, September 7 and Monday, September 12
Revere (Abraham Lincoln School)	5:30-8:00 p.m.	Thursday, September 8 and Tuesday, September 13
Westwood H.S.	5:30-8:00 p.m.	Thursday, September 8 and Tuesday, September 13
Weymouth North H.S.	5:30-8:00 p.m.	Wednesday, September 7 and Monday, September 12
Fall Quarter Classes Begin		Monday, September 26
Columbus Day Observed	No Classes	Monday, October 10
Veterans' Day Observed	No Classes	Friday, November 11

Thanksgiving Recess	No Classes	Thursday-Saturday, November 24-26
Final Examination Period for Fall Quarter		Monday-Saturday, December 12-17
Christmas Vacation	No Classes	Monday-Monday, December 19- January 2

Winter Quarter 1984

Classes Begin Tuesday, January 3, 1984

Winter Registration Dates

Boston	5:30-8:00 p.m.	Monday-Thursday, December 5-8
	5:30-7:00 p.m.	Friday, December 9
Burlington	5:30-8:00 p.m.	Monday-Thursday, December 5-8
Belmont H.S.	5:30-8:00 p.m.	Tuesday, December 6
Brockton H.S.	5:30-8:00 p.m.	Monday, December 5
Chelmsford H.S.	5:30-8:00 p.m.	Tuesday, December 6
Dedham Campus	5:30-8:00 p.m.	Monday, December 5 and Tuesday, December 6
Framingham North H.S.	5:30-8:00 p.m.	Monday, December 5 and Tuesday, December 6
Lynnfield Middle School	5:30-8:00 p.m.	Tuesday, December 6
Marlborough H.S.	5:30-8:00 p.m.	Monday, December 5
Marshfield H.S.	5:30-8:00 p.m.	Tuesday, December 6
Milford H.S.	5:30-8:00 p.m.	Tuesday, December 6
North Attleboro H.S.	5:30-8:00 p.m.	Wednesday, December 7
Norwood Jr. H.S. North	5:30-8:00 p.m.	Monday, December 5 and Wednesday, December 7
Revere (Abraham Lincoln School)	5:30-8:00 p.m.	Tuesday, December 6
Westwood H.S.	5:30-8:00 p.m.	Tuesday, December 6
Weymouth North H.S.	5:30-8:00 p.m.	Tuesday, December 6 and Wednesday, December 7
Winter Quarter Classes Begin		Tuesday, January 3
Martin Luther King Jr.'s Birthday	No Classes	Monday, January 16
Presidents' Day	No Classes	Monday, February 20
Final Examination Period for Winter Quarter		Tuesday-Monday, March 20-26
Spring Recess (or make-up period for lost snow days)		Tuesday-Saturday, March 27-31

Spring Quarter 1984

Classes Begin Monday, April 2, 1984

Spring Registration Dates

Boston	5:30-8:00 p.m.	Monday-Thursday, March 12-15
Burlington	5:30-8:00 p.m.	Monday-Thursday, March 12-15
Belmont H.S.	5:30-8:00 p.m.	Tuesday, March 13
Brockton H.S.	5:30-8:00 p.m.	Wednesday, March 14
Chelmsford H.S.	5:30-8:00 p.m.	Tuesday, March 13
Dedham	5:30-8:00 p.m.	Monday, March 12 and Wednesday, March 14
Framingham North H.S.	5:30-8:00 p.m.	Monday, March 12 and Tuesday, March 13
Lynnfield Middle School	5:30-8:00 p.m.	Tuesday, March 13
Marlborough H.S.	5:30-8:00 p.m.	Monday, March 12
Marshfield H.S.	5:30-8:00 p.m.	Tuesday, March 13

Milford H.S.	5:30-8:00 p.m.	Tuesday, March 13
North Attleboro H.S.	5:30-8:00 p.m.	Monday, March 12
Norwood Jr. H.S.	5:30-8:00 p.m.	Monday, March 12 and Wednesday, March 14
Revere (Abraham Lincoln School)	5:30-8:00 p.m.	Tuesday, March 13
Westwood H.S.	5:30-8:00 p.m.	Tuesday, March 13
Weymouth North H.S.	5:30-8:00 p.m.	Monday, March 12 and Wednesday, March 14
Spring Quarter Classes Begin		Monday, April 2
Patriots' Day Observed	No Classes	Monday, April 16
Memorial Day Observed	No Classes	Monday, May 28
Final Examination Period for Spring Quarter		Monday-Saturday, June 11-16
Commencement		Sunday, June 17

Summer Quarter 1984	Classes Begin Monday, June 18, 1984
----------------------------	--

Registration for entire Summer Quarter

Boston	5:30-8:00 p.m.	Tuesday-Friday, May 29-June 1
Burlington	1:00-3:00 p.m. and 5:30-8:00 p.m. 5:30-8:00 p.m.	Tuesday, May 29 Wednesday, May 30 Monday, June 18
Summer Quarter Classes Begin		

Registration for second five-week term

Boston	5:30-8:00 p.m.	Monday, July 9 and Tuesday, July 10
Burlington	5:30-8:00 p.m.	Monday, July 9
Independence Day Observed	No Classes	Wednesday, July 4
Labor Day Observed	No Classes	Monday, September 3
Final Examination Period for Summer Quarter		Held during last class session of each term

Calendar changes may be made. The University community will be notified if such changes are necessary.

The University

Founded in 1898, Northeastern University is incorporated as a privately endowed nonsectarian institution of higher learning under the General Laws of Massachusetts. By special enactment, the State Legislature has given the University general degree-granting powers. The University is governed by a Board of Trustees elected by and from the Northeastern University Corporation, a body of nearly 200 distinguished business and professional men and women.

From its beginning, Northeastern University's dominant purpose has been to identify community educational needs and to meet these needs in distinctive and serviceable ways. The University has not duplicated the programs of other institutions, but has pioneered new areas of educational service.

A distinctive feature of Northeastern University is its Cooperative Plan, under which students alternate periods of work and study. This time-tested method of education offers students the opportunity to gain valuable practical experience as an integral part of their college programs and to contribute to the financing of their education. All Northeastern's undergraduate colleges operate on the Cooperative Plan, which requires five years for the student to earn a degree. The College of Arts and Sciences also offers a four-year noncooperative option. Several of Northeastern's graduate schools have structured their programs to include the features of cooperative education.

In the field of adult education, Northeastern University offers graduate and undergraduate degree programs and noncredit programs that are specifically designed to meet the needs and interests of adults who wish to further their education on a part-time basis.

All formal courses of study leading to degrees in the graduate division, Lincoln College, and University College are approved by the undergraduate faculties concerned, and are governed by the same qualitative and quantitative standards as the regular day curricula. Courses are scheduled in the day and evening at Northeastern's campuses in Boston and Burlington. Evening courses are scheduled in Belmont, Brockton, Chelmsford, Dedham, Framingham, Lynnfield, Marlborough, Marshfield, Milford, North Attleboro, Norwood, Revere, Westwood, and Weymouth.

For more information about the undergraduate colleges, their programs, or the cooperative plan of education, contact the Admissions Office, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115, tel. 617-437-2200.

Undergraduate Colleges

College of Arts and Sciences The College of Arts and Sciences offers majors in the arts, humanities, social sciences, and mathematics/sciences leading to the Bachelor of Arts and Bachelor of Science degrees. Curricula are normally four years in length on a full-time plan or five years in length on the Cooperative Plan.

Boston-Bouvé College of Human Development Professions Boston-Bouvé College of Human Development Professions offers programs of study leading to the degrees of: Bachelor of Science in Education in the fields of elementary education, human services, physical education, school and community health education, secondary education, and speech and hearing; Bachelor of Science in Recreation and Leisure Studies; and Bachelor of Science in Physical Therapy.

College of Business Administration The College of Business Administration offers a five-year program of academic study and cooperative education leading to the Bachelor of Science degree in Business Administration. Students must complete a six-course concentration in Accounting, Human Resources Management, Marketing, Finance and Insurance, Management, International Business Administration, Entrepreneurship and New Venture Management, Transportation and Physical Distribution Management, or a self-designed concentration.

College of Computer Science The College of Computer Science offers a five-year cooperative education curriculum in Computer Science leading to the degree of Bachelor of Science in Computer Science.

College of Criminal Justice The College of Criminal Justice offers a full-time day curriculum on the Cooperative Plan leading to the degree of Bachelor of Science.

College of Engineering The College of Engineering offers five-year cooperative curricula in Civil (including an environmental engineering option), Mechanical, Electrical (including a power systems option and a computer engineering option), Chemical, and Industrial Engineering and

Information Systems leading to the degree of Bachelor of Science with specification according to the engineering department in which the student qualifies. A more general program without specification leading to the Bachelor of Science degree is offered in which students design their curricula around a core of science, engineering science, and engineering courses (for example, computer science). For highly qualified students, most departments offer a five-year program leading to both bachelor's and master's degrees; students carry course overloads beginning in the third year. The College also offers part-time programs during evening hours leading to Bachelor of Science degrees in Civil, Mechanical, and Electrical Engineering, extending over eight years and meeting the same qualitative and quantitative standards of scholarship as the day curricula.

Lincoln College Lincoln College offers engineering technology programs leading to the degrees of Associate in Engineering, Associate in Science, and Bachelor of Engineering Technology. These programs are made available as:

- (a) A full-time day curriculum on the Cooperative Plan leading to the degree of Associate in Engineering (A.E.) and of Bachelor of Engineering Technology (B.E.T.) in Mechanical and Electrical Engineering and in Computer Technology.
- (b) A part-time evening program including pre-technology preparatory courses and degree programs leading to the Associate in Engineering (A.E.) and the Bachelor of Engineering Technology (B.E.T.) in Civil, Mechanical, and Electrical Engineering and in Computer Technology. The Associate in Science degree may be earned in Telecommunications.

The day B.E.T. program is often useful for the high school graduate or the student transferring from a community college or technical institute who desires a full-time day curriculum on the Northeastern Cooperative Plan.

In addition to its traditional curricula, Lincoln College offers technological and professional development opportunities to meet special needs of the part-time student.

College of Nursing The College of Nursing was established at Northeastern University in 1964. The baccalaureate nursing program operates on the Cooperative Plan, is five years in length, and leads to the Bachelor of Science in Nursing.

In 1974 the College of Nursing also instituted a day section for registered nurses who wish to complete the Bachelor of Science degree in

Nursing. Since January 1979, registered nurses may complete requirements for the Bachelor of Science degree in Nursing full time during the day or part time in the evening. The College of Nursing collaborates with University College in offering the evening section for registered nurses.

In order to matriculate, registered nurses must first be admitted by the Northeastern University Basic College Department of Admissions, 150 Richards Hall; telephone 617-437-2200. Once admitted, registered nurses may receive advanced placement credit by successfully passing challenge examinations in several non-nursing and several nursing subject areas.

Information sessions are held on a regular basis at the College of Nursing. Telephone 617-437-3029 for the time and place of the sessions.

College of Pharmacy and Allied Health Professions The College of Pharmacy and Allied Health Professions offers five-year cooperative curricula leading to the degrees of Bachelor of Science in Pharmacy, Bachelor of Science in Respiratory Therapy, and Bachelor of Science in Toxicology, and to the Bachelor of Science degree with majors in medical laboratory science and health record administration. Associate degree programs are offered in medical laboratory science (MLT), respiratory therapy, and dental hygiene. In cooperation with the medical schools and teaching hospitals in the Boston area, the college offers a professional program for physician assistants.

University College University College, so called because it draws upon the resources of the other colleges of the University, offers part-time day and evening programs in arts and sciences, business administration, law enforcement, and health professions, leading to the Associate in Science, Bachelor of Arts, and Bachelor of Science degrees. It does not duplicate the offerings of the day colleges, but provides curricula that cut across traditional subject-matter areas to meet the particular needs of adult students. Students may pursue a degree or simply take courses based on needs and interests, up to a total of 18 quarter hours of credit per quarter. Courses are offered in Boston as well as Burlington, Belmont, Chelmsford, Framingham, Milford, Revere, Westwood, Weymouth, Brockton, Norwood, Marshfield, Lynnfield, Marlborough, Dedham, and North Attleboro.

University College also offers two full-time day

programs. The Radiologic Technology Program (28 months) and the Dental Assistant Program (1 year) are offered in cooperation with a variety of local clinical facilities. Each program has a separate application procedure and special requirements for admission. Students may enroll as degree candidates or elect single courses appropriate to their needs and interests. Courses are scheduled in the day and evening at the Boston Campus, Suburban Campus in Burlington, and other off-campus locations near Boston.

Alternative Freshman-Year Program

The Alternative Freshman-Year Program is offered by Northeastern University through University College. It is designed for students who want to go to college but whose high school records do not reflect their true abilities. Because it is structured to assist students in making the academic and social adjustments necessary for success in college, this program is well suited to those who feel that their potential is not reflected by their high school records and/or believe that they are not ready to undertake a full college curriculum.

The Alternative Freshman-Year Program is specifically designed to help students strengthen their basic academic skills in writing as well as mathematics. While helping them gain confidence in their ability to do college-level work, the program also offers students an opportunity to sample different areas of study before committing themselves to a specific major. In conjunction with the prescribed curriculum, professional counselors work with each student to establish a program suited to his or her individual needs. These same counselors are normally available on a continuing basis throughout the student's entire freshman year.

Developed in collaboration with University College, a division of Northeastern serving students who seek a flexible college program, the Alternative Freshman-Year Program has a proven record of success in assisting students to develop their full potential. Freshmen entering Northeastern University through this program have regularly achieved sophomore status in eligible degree programs with about the same frequency as their freshman counterparts throughout the University.

Students who complete the program, achieving a cumulative quality-point average of 1.400 or better and completing specific program requirements as noted, may generally continue their de-

gree programs within University College or transfer, with sophomore status, to the College of Business Administration, the College of Criminal Justice, the College of Pharmacy and Allied Health Professions, Boston-Bouv  College of Human Development Professions, or the College of Arts and Sciences.

Graduate Schools

For more information about the graduate schools and their programs, contact the individual school.

Arts and Sciences The Master of Arts degree may be earned in Economics, English, History, Political Science, Psychology, Sociology, and Social Anthropology. The Master of Science degree is available in Biology; Chemistry; Economics Policy and Planning; Law, Policy, and Society; Mathematics; and Physics. The Master of Science in Health Science and the Master of Public Administration degrees are also offered. In addition, there is an advanced Literary Study Program leading to the Certificate of Advanced Graduate Study, and programs leading to the Doctor of Philosophy degree in Biology; Chemistry; Economics; Law, Policy, and Society; Mathematics; Physics; Psychology; and Sociology. Most programs may be completed through either full- or part-time study.

Boston-Bouv  College of Human Development Professions The Master of Science degree may be earned, with specialization in Physical Education, Physical Therapy, or Recreation and Leisure Studies. Graduate courses in Health Education are available as electives within the College and for special students. Programs may be completed through full- and part-time study.

The Master of Education degree may be earned, with specialization in Community Mental Health Counseling, Curriculum and Instruction, Educational Administration, Educational Research, Human Development, Industrial Counseling, Rehabilitation and Special Education, School and College Counseling, and Speech-Language Pathology. The Certificate of Advanced Graduate Study is offered in Counselor Education, Educational Administration, and Rehabilitation Counseling. The Doctor of Education degree may be earned in Administration and Supervision, with specialization in Counselor Education, Educational Administration, or Rehabilitation Administration.

Business Administration A Master of Business Administration degree may be earned. The Grad-

uate School of Business Administration offers a variety of programs to meet the needs and schedules of graduate business students. Two full-time program alternatives are offered: a twenty-one month Management Intern Program, which includes a six-month, paid professional internship; and a two-year traditional full-time program, which may include administrative or teaching assistantship opportunities. Individuals who wish to continue their full-time job responsibilities while earning an M.B.A. degree may consider the evening part-time program of study, the eighteen-month Executive M.B.A. Program for upper-level managers, or the accelerated part-time High-Technology M.B.A. for qualified technical specialists.

The Master of Science degree in professional accounting is an intensive, full-time program specifically designed for liberal arts and other non-accounting majors.

In addition, there is a nondegree Program for Advanced Study in Business Administration leading to the Certificate of Advanced Study in Business Administration.

The Center for Management Development offers several intensive, graduate-level programs within the College of Business Administration. They are designed to provide professional growth and to improve the overall performance of experienced managers. Based on a modified Northeastern cooperative format, these programs permit company-sponsored participants to maintain their job responsibilities while attending classes. The Management Development Program spaces six weeks of in-residence instruction over four or five months, depending upon the choice of session. Sessions begin in October, January, and March on Phillips Academy campus in Andover, Massachusetts.

The Center also sponsors Management Workshops, scheduled one day each week for ten or twelve weeks at an off-campus facility. The three specialized workshops focus on core functional areas, advanced management concepts, or management in high-technology organizations.

Criminal Justice The College of Criminal Justice offers both full- and part-time programs leading to a Master of Science degree in Criminal Justice and a Master of Science degree in Forensic Chemistry. Students enrolled in the Master of Science program in Criminal Justice choose among five major concentrations of study: Administration and Planning, Criminology, Criminal Justice Counseling, Research Methodology, and

Security Administration. The Master of Science program in Forensic Chemistry provides an integrated study of forensic chemistry as utilized in criminalistics laboratories and related professional fields. An interdisciplinary Ph.D. program in Forensic Chemistry is offered through the College of Arts and Sciences in conjunction with the College of Criminal Justice, with specialization in Forensic Materials Science or Forensic Analytical Chemistry. A further specialization in Forensic Toxicology is offered through the College of Pharmacy and Allied Health Professions in conjunction with the College of Criminal Justice. Students in either program attend classes during late afternoon and evening hours.

Engineering Master of Science degrees are offered with course specifications in the fields of Civil Engineering, Chemical Engineering, Electrical Engineering, Engineering Management, Industrial Engineering, Information Systems, Mechanical Engineering, and Transportation. A five-year program leading to both a bachelor's and master's degree is offered in Electrical Engineering and Mechanical Engineering, and a six-year program leading to both a bachelor's and master's degree is offered in Power Systems. Professional Engineers degrees are offered in Electrical, Industrial, and Mechanical Engineering. Ph.D. degrees are offered in Civil, Chemical, Electrical, and Mechanical Engineering. A Doctor of Engineering degree in Chemical Engineering is offered in addition to the Ph.D. A Women in Engineering program is also available.

Law The School of Law offers a full-time program of professional instruction leading to the degree of Juris Doctor (J.D.). The three-year curriculum includes twelve months of experience in law offices, governmental agencies, or other law-related employment. There are no courses for part-time or evening students.

Pharmacy and Allied Health Professions The Master of Science degree is offered in Biomedical Science, Clinical Chemistry, Hospital Pharmacy, Medical Laboratory Science, Medicinal Chemistry, Pharmacology, and Radiopharmaceutical Science. The Ph.D. degree is offered in Biomedical Science with specialization in Medical Laboratory Science, Medicinal Chemistry, Pharmaceutical Science, or Pharmacology. An interdisciplinary doctoral degree is available in Forensic Chemistry as well as a graduate program in Clinical Pharmacy, which leads to the degree Doctor of Pharmacy (Pharm. D.).

Professional Accounting The Graduate School of Professional Accounting is designed specifically for Arts and Sciences majors. The distinctive feature of the fifteen-month, full-time Master of Science degree program is a three-month paid internship with a public accounting firm.

Insurance Institute

The Insurance Institute is sponsored by local insurance organizations and companies. It offers a number of noncredit courses in preparation for the Chartered Life Underwriter and Chartered Property-Casualty Underwriter designations as well as for the General Insurance, Insurance Adjuster, and Risk Management certificates.

Center for Continuing Education

The Center for Continuing Education was established to connect the University with various educational needs of its urban community. Its purpose is to assist both individuals and organizations who wish to keep pace with a society in the process of accelerated social and economic change. The Center offers a wide range of workshops, conferences, institutes, forums, and special training programs in areas that include business, health, engineering, graphic arts, and food service. For more information, please write or call the Northeastern University Center for Continuing Education, 370 Common Street, Dedham, Massachusetts, 02026; telephone 617-329-8000.

Research

Research, whether performed in the laboratory, library, or in the field, is vital to a college education. It stimulates all participants and ensures a thriving academic atmosphere. Through research, faculty members, as well as students, stay abreast of the most recent developments in their particular fields. Faculty who disseminate this knowledge, through publishing, speaking, and teaching, help ensure a university education of the first order.

At Northeastern, we take research and scholarly endeavors very seriously. Each year more faculty receive funding for an ever increasing number of research projects. Sponsorship comes from a variety of places. Federal agencies, private industry and foundations, and the University itself all contribute to Northeastern's growing research emphasis.

While much of this research is carried out by the faculty members, their graduate students, and post-doctoral research associates, ample opportunities also exist for undergraduate students. Re-

search participation can take place as part of regular academic programs, as specially designed independent studies, or through cooperative work assignments. Research activities are encouraged and limited only by the student's own motivation and curiosity.

Northeastern University has numerous distinguished faculty members, many of whom have received prestigious awards, including Sloan Scholarships, Guggenheim Fellowships, and National Institutes of Health Research Awards. Faculty members lecture the world over—from just across the Charles River in Cambridge to clear across the Pacific Ocean in Sydney, Australia.

Additionally, many faculty serve as United States government consultants and participate on a variety of national and international committees.

But, because Northeastern considers education its primary mission, you'll always find an enthusiastic and accessible faculty to answer questions, solve problems, and stimulate your mind.

Current research spans almost every academic and professional field and is not limited to laboratory investigations or the "hard" sciences. Every department of every college at Northeastern carries out some basic or applied research projects.

A brief summary of some of the topics presently under investigation by the faculty and students follows. Perhaps something here will spark hidden interests that students never realized they had. Students desiring to explore the opportunities for research participation should inquire at the appropriate department offices.

In the *College of Arts and Sciences* research projects reflect the diversity of its seventeen departments. Research in the humanities and natural and social sciences includes studies in nineteenth-century Boston architecture, the Off-Off Broadway theater, cable TV, quantum field theory, and infrared spectroscopy.

As part of the College's interdisciplinary interest in marine sciences, the Marine Science and Maritime Studies Center has been established. At its Nahant field station and laboratory, faculty and graduate students carry on research in marine chemistry, biology, and botany.

Research in the *College of Engineering* encompasses some of today's hottest technological subjects. Robotics, telecommunications, space rocketry design, and the latest in computer graphics are major fields of interest within the College. But not all studies are high-technology oriented. Indeed, some faculty pursue projects

dealing with the electrical properties of human blood vessels, while others investigate the components of Venezuelan red mud. These seemingly diverse research areas do have one thing in common, however; they deal with the improvement of our quality of life.

The *College of Criminal Justice* is one of the few institutions of its kind in the United States to study crime and law in an interdisciplinary fashion. Lawyers, social and forensic scientists, and system specialists are encouraged by the College to participate in research activities focusing on both crime detection and prevention. Some research directions currently pursued by faculty include industrial espionage, private security systems, and contemporary terrorism.

The *School of Law's* research activities concentrate on the legal system from a perspective encompassing the past, present, and future. Topics include a historical look at the Securities and Exchange Commission, a present view of new civil procedures, and some future musings on the effects of a landmark court case on the mental health profession. Law school curricula also come under investigative scrutiny.

The nature of research in *Boston-Bouvé College of Human Development Professions* is broad in range and diverse in approach. Changes in human development and the roles of the teacher and clinician in facilitating such changes are topics of lively interest. Some of the current research interests of the College include the communication abilities in normal and hearing-impaired individuals, the role of exercise in cardiovascular health and disease, the relation between age change and the development of motor and cognitive skills in children, the evaluation of clinical practice in physical therapy and educational practices in the schools, and the examination of barriers to the employment of the disabled in leisure services.

The *School of Nursing*, through its research activities, addresses some of the important problems currently facing the entire nursing profession. One answer to nursing "burnout" may be found in the School's new school nurse practitioner program. Assessments of this new direction in nursing and other employment possibilities and problems are areas in which the faculty is directing its research efforts.

Research objectives in the *College of Pharmacy and Allied Health Professions* have important ramifications for everyone's better health. Studies include investigating new ways to analyze

antidepressant and anticonvulsant drugs, improving methods to diagnose bladder cancer, and studying clinical applications in respiratory therapy. The National Institutes of Health, Dow Chemical Company, and the American Heart Association sponsor some of this work.

Research within the *College of Business Administration* divides itself between the theoretical and practical aspects of management, human resources, and marketing. New ideas in corporate practice and academic theory are being realized through conclusions reached by a faculty examining such topics as high-technology management, small-business entrepreneurship, and foreign investment in developing countries. Other studies concentrate on transportation problems in the U.S., government regulation in industry, and technological forecasting in high-technology firms.

Northeastern University is its own research subject for the *Cooperative Education Research Center*. Through an annual census and other statistical surveys, data on cooperative education are compiled. Because Northeastern University is a major force in cooperative education in this country, it seems only appropriate that this information clearinghouse and research facility should be located here. Conclusions reached may affect your own education, since they cover cooperative education's impact on college costs, career opportunities, and life satisfaction.

To meet the needs of the entire academic community, Northeastern also has several interdisciplinary centers and institutes. Although they do not grant degrees, they do perform a variety of interesting and relevant research.

The *Institute of Chemical Analysis, Applications, and Forensic Science* has as its goal basic research in the fields of analytical chemistry and material science and its application to problems of social relevance. The Institute has developed an international reputation in the fields of chromatography, mass spectrometry, amorphous metals, and solar energy storage devices.

The *Center for Electron Microscopy* is a self-contained research unit that utilizes the latest scientific equipment for training and research into cellular and subcellular structures.

Critical issues in education and a forum for the exchange of ideas and information are provided through the *Institute for the Interdisciplinary Study of Education*, where research deals with the high-technology industry, South African education, and community college programs for prisoners.

The *Center for Applied Social Research* is a University-wide institute that deals with issues of public policy and social research. Projects are currently underway in the fields of criminal justice, public safety, mental health, social welfare, and education.



Buildings and Facilities

In 1910, Northeastern University began new construction of the first piece of property acquired at its present site on 360 Huntington Avenue. Since those early days, the central Boston Campus has grown to occupy over fifty acres of land located in close proximity to such cultural landmarks as Symphony Hall, the Museum of Fine Arts, the Isabella Stewart Gardner Museum, Horticultural Hall, and the Boston Public Library. The University is within walking distance of the Fenway, a large park that includes a beautiful rose garden and extensive jogging paths. Copley Place, the Back Bay shopping district, and a number of renowned hospitals, including Brigham and Harvard teaching hospitals, are also minutes away.

Major transportation facilities serving the Boston area are Logan International Airport, two rail terminals, bus terminals serving inter- and intra-state lines, and MBTA subway-bus service within the metropolitan-suburban area. There is a subway stop directly in front of the campus. For motorists coming from the west, the best routes to the campus are the Massachusetts Turnpike (Exit 22) and Route 9, of which Huntington Avenue is the intown section. From the north, motorists may take Route 95 to the Southeast Expressway (Route 3) to Massachusetts Avenue, which intersects Huntington Avenue. Visitors driving from the south should take the Southeast Expressway and the Massachusetts Avenue exit.

The Boston Campus is divided by Huntington Avenue, with academic and administrative buildings on one side and most dormitories on the other. Many of the educational buildings are interconnected by underground passageways, which are especially convenient during inclement weather.

In addition to several off-campus athletic facilities and University College's fourteen branch locations, Northeastern University maintains a variety of affiliations that provide its students access to specialized equipment and facilities at other institutions and organizations.

Carl S. Eli Student Center

The Carl S. Eli Student Center provides facilities for student recreation and extracurricular activities. The Alumni Auditorium, with a seating capacity of 1,300, is part of the Center. Also

included are special drama facilities, a ballroom, a main lounge, a fine arts exhibition area, student offices, conference rooms, and a dining area seating more than 1,000 persons.

The University Library

The University Library System includes the Dodge Library and the three graduate libraries: Chemistry, 112 Hurtig Hall, which includes Chemical Engineering, Biology, Pharmacy, and the Health Sciences; Physics/Electrical Engineering, 324 Dana Hall; and Mathematics/Psychology, 531 Nightingale Hall. The Suburban Campus Library supports the programs at Burlington and Dedham. Other collections are at the Marine Science and Maritime Studies Center in Nahant, at the Dedham campus, and at the Center for Management Development in Andover. There is also the Law Library located in the Knowles Center.

The University Library collections consist of over 505,000 bound volumes and 555,000 microform volumes. The periodical titles number 4,000, additional continuation titles 1,243, and sound recordings 10,000.

1. The Reference Collection in the Cabot Reading Room on the main floor of the Dodge Library contains 20,000 volumes. This collection is of major importance to anyone using the Library. The researcher should be aware of the source books, handbooks, bibliographies, etc., before beginning an investigation of the literature.

The Reference Division includes the Government Documents Collection, located in 14 Dodge, and the Microforms Collection, located in 108 Dodge. Additional sources of information are the Business Services, Technical Reports, Annual/Company Reports, and the Information File for pamphlet materials.

2. The Periodical Collection in the Webster Reading Room on the main floor consists of Indexing and Abstracting Services and the current periodicals, mainly in literature, humanities, social sciences, and general science, as well as foreign and domestic newspapers.

This collection supports the Reference Collection and brings up to date the General Collection by encompassing the latest developments in all fields of knowledge.

The Periodical Stacks are adjacent to the collection and are serviced by the library staff.

3. The General Collection is located on the three floors and two stack levels of the Dodge Library, indicated by posted floor plans and guides available at the Information Desk.

4. The Reserve Book Collection is located in 204 Dodge. This collection of textbooks and assigned reading supports classroom lectures and laboratories as well as providing additional in-depth information.

5. The Public Catalog, located on the main floor, includes author, title, and subject cards for the foregoing collections, except for documents, technical reports, and complete entries for periodicals, which will be found in catalogs in those areas. The Public Catalog includes both the Dewey Decimal classification and the Library of Congress classification.

6. The Circulation Department manages the organization of the General Collection. Materials are charged out and returned at the Circulation Desk. A daily computer printout of items on loan is available to assist in locating books not found on the shelves.

7. The Inter-Library Loan Department is located in 18 Dodge. This service should be used for materials not available in the system and for serious research.

8. The Music Reference Service is located in 401 Dodge. This collection of books, scores, records, and tape cassettes is for assigned listening and personal enjoyment. The collection contains both music and spoken word.

9. The Learning Resources Center, 406 Dodge, is a service for programmed and language instruction utilizing audio/visual/video equipment teaching programs to support classroom work and independent study.

10. The Divisional Libraries, the Burlington Campus Library, and the Law School Library have the same services and card catalogs to support those disciplines.

Library Hours

Dodge Library

Mon.-Thurs.	7:45 a.m. to 10:00 p.m. (10:00 p.m. to midnight)*
Friday	7:45 a.m. to 7:30 p.m.
Saturday	12:00 noon to 4:00 p.m. (4:00 p.m. to 10:00 p.m.)*
Sunday	12:00 noon to 4:00 p.m. (4:00 p.m. to midnight)*

*References and Periodicals; for study only.

Divisional Libraries

Mon.-Thurs.	8:30 a.m. to 10:00 p.m.
Friday	8:30 a.m. to 7:30 p.m.
Saturday-Sunday	Closed

Suburban Campus Library

Mon.-Thurs.	8:30 a.m. to 9:00 p.m.
Friday	8:30 a.m. to 5:00 p.m.
Saturday	8:30 a.m. to 1:00 p.m.
Sunday	Closed

Office of Learning Resources

The primary objective of the Office of Learning Resources is to help support the instructional and communications needs of the University. A variety of services is available to students and faculty.

The Learning Resources Center furnishes students with tutoring services and individualized study facilities in support of regular course requirements, as well as supplemental instruction in many subject areas. Study materials here are presented in varied formats, including programmed texts, audiotapes, videotapes, sound filmstrips or slides, computer-assisted lessons and exercises, and related workbooks. The facility is located in 406 Dodge Library. The hours are 8:00 a.m. to 8:00 p.m. Monday through Thursday, 8:00 a.m. to 7:00 p.m. Friday, and 1:00 p.m. to 5:00 p.m. Saturday and Sunday.

Instructional Materials Services, 416 Dodge Library, acquires and maintains the collection of Northeastern-owned instructional materials and provides a rental service for 16mm. films and videotapes obtained from outside sources.

Campus Media Services makes available, on a prescheduled basis, all types of audiovisual and video equipment and instructional materials for the support of classroom instruction. Items include films, filmstrips, slides, opaque and overhead projectors, audio and videotape recorders, TV cameras and monitors, portable public address systems, telelecture equipment, record players, and projection screens. This office is located in Room 2 of the Ell Building.

Media Production Services, located in 413 Dodge Library, coordinates and provides professional consultation and specialized services in graphics, photography, audio recording, television, and multimedia production for various University needs.

Visitor Information Center

The Visitor Information Center, located in Room 115 Richards Hall, provides general information and assistance to students and faculty as well as to visitors to the University. The Center's staff is prepared to answer questions, give directions, provide telephone numbers, and distribute publications related to the University's departments,

functions, and services. The Center also provides the services of a public notary and a twenty-four-hour recorded "events" telephone line, 1-800-322-1277. Open Monday through Friday from 8:00 a.m. to 8:30 p.m., the Center also offers its services over the telephone. Please call 617-437-2736 or 3281.

Counseling and Testing Center

Counseling and testing to aid a student or prospective student with career, educational, or personal concerns are available days and certain weekday evenings until 8:30 p.m. Information and appointments may be obtained by calling 617-437-2142 or by visiting the Counseling and Testing Center, 302 Ell Student Center.

Cabot Physical Education Center

The Godfrey Lowell Cabot Physical Education Center is one of the best equipped facilities in New England. It contains four basketball courts, an athletic cage, a women's gymnasium, and administrative offices for the Department of Athletics and for the Physical Education Department of Boston-Bouvé College of Human Development Professions.

The Barletta Natatorium houses a 105-foot swimming pool, a practice tank for the crew, handball/racquetball courts, and shower and dressing facilities.

Dockser Hall

Charles and Estelle Dockser Hall, completed in 1968, houses a large gymnasium, dance studio, motor performance laboratory, community recreation laboratory, folk arts center, dark room, recreation resources area, locker rooms, offices, classrooms, conference room and lounge, storage facilities, and a cardiovascular health and exercise laboratory.

Dedham Campus

One of Northeastern's most recent acquisitions is the twenty-acre Dedham Campus on Route 135 just north of Route 128. This recently renovated facility contains eleven classrooms, two executive case-study rooms, a dining area, and a computer room. There are also a library and a number of seminar rooms used by a new High-Technology MBA program and University College's Center for Continuing Education.

Suburban Campus

The Burlington Campus of Northeastern University was established in 1964 because businesses

and industries in the Route 128 area expressed a need for educational programs that their employees could utilize. The campus is located near the junction of Routes 128 and 3 in Burlington, Massachusetts.

The diversity of programs offered at Burlington encompasses undergraduate, graduate, and continuing education courses. Full- and part-time degree programs, as well as nondegree certificate programs, are available.

Henderson House

The University's conference center, Henderson House, is located in Weston, Massachusetts, twelve miles from the Boston Campus. Henderson House provides a gracious setting for both large and small conferences and meetings, and its facilities include a dining service and some overnight accommodations. For more information about Henderson House, please telephone 617-329-8000, ext. 13.

Warren Center

The Warren Center is located on 165 acres in Ashland, Massachusetts, thirty miles west of Boston. Although it serves as a practical laboratory for students in Boston-Bouvé College of Human Development Professions, the Warren Center invites Northeastern's staff, faculty, alumni, and students to use its facilities and welcomes other educational groups seeking enrichment in an outdoor setting. Woods, fields, streams, winterized cottages, and Hayden Lodge provide year-round opportunities for outdoor learning. The Center also has an archery range, an outdoor pavilion, heated cabins, a health lodge, and conference accommodations.

Marine Science and Maritime Studies Center

The Marine Science and Maritime Studies Center, located in Nahant, Massachusetts, is a research and instructional facility primarily engaged in the study of marine biology and oceanography. Many of the courses at the Institute are applicable toward an advanced degree in biology or health science. The Institute, located about twenty miles northeast of Boston, is in operation all year.

The George and Hope Matthews Arena

Two blocks and a right turn from the main quadrangle of Northeastern University's Boston Campus is the oldest indoor ice hockey arena in the United States and one of the focal points for amateur athletics in the Boston area. With more than a million and a half dollars already invested for

major renovations, the Arena is a credit to the community. The building is used primarily for collegiate sports, especially men's and women's basketball and hockey contests, and other recreational activities. Northeastern also makes the Arena available to the community for certain events.

University College

John W. Jordan, Dean

Robert W. O'Connor, Associate Dean for
Academic Programs

Ralph T. Vernile, Jr., Associate Dean for
Administration

The Programs

University College is committed to the education of mature adult students who wish to live effectively in today's complex society. The programs in the College are specifically designed to satisfy the changing professional, cultural, and social needs and interests of adults. They are constantly evaluated, and redesigned when necessary, to keep pace with students and community.

Degree programs have been developed in 33 major fields of study in the areas of business administration, arts and sciences, law enforcement, and health professions. Courses are offered on a part-time basis Monday through Saturday during day and evening hours convenient for adults. Students may elect single courses, pursue a certificate program, or enroll in full-degree programs leading to the Associate in Science or the Bachelor's degree. Short-term seminars are also offered for credit. Classes are scheduled in several locations that are accessible to the urban and the suburban community.

University College also offers two full-time day programs. The Radiologic Technology Program (28 months) and the Dental Assistant Program (1 year) are offered in cooperation with a variety of local clinical facilities. Each program has a separate application procedure and special requirements for admission.

The Faculty

Approximately 1,000 men and women compose the part-time teaching staff of University College. Included are members of the full-time faculty of Northeastern University and other educational institutions in New England, as well as outstanding New England business and professional leaders with training and experience in specialized areas. The faculty are selected because they are highly successful in their fields and are well qualified to provide sound methods of teaching for adults in an interesting, inspiring, and effective manner.

The Student Body

The student body of University College represents the diversity of interests that is one of the basic strengths in adult education. Approximately 16,000 students range in age from 18 years to beyond retirement. Some enroll immediately after high school graduation. Others may have graduated several years ago.

University College students can have full-time commitments to their jobs, families, or other responsibilities. They may enroll in a single course or in a full-degree curriculum, depending on whether their goals are career related or for personal enrichment.

University College Administrative Officers

John W. Jordan, B.S., M.Ed., *Dean of University College*
 Ann A. Barto, B.S., *Assistant Director for Office Services*
 Stanley A. Bozen, A.R.R.T., *Director of the Radiologic Technology Program*
 Richard J. Comings, A.B., M.A., *Assistant Dean and Director of Special Programs*
 Edward J. Czarnowski, B.S., Ed.M., C.L.U., *Assistant Dean and Director of Insurance Institute*
 Janet Fisher Doyle, B.A., M.Ed., *Assistant Director, University College Placement*
 Michael S. Dvorchak, B.A., M.A., *Associate Dean and Director of Suburban Campus*
 William T. Edgett, A.B., M.A., *Assistant Dean and Assistant Director, Academic and Student Affairs*
 Carol L. Fulton, B.A., B.S., *Assistant Director, Academic and Student Affairs*
 Kathleen H. Hayes, A.B., Ed.M., *Assistant Director, Academic and Student Affairs*
 David R. Kane, B.S., *Registrar*
 Eleanor A. King, A.S., C.D.A., *Director of the Dental Assistant Program*
 Madge Lewis, B.S., M.Ed., *Associate Registrar, Center for Continuing Education*
 Holly W. Matisis, B.A., *Administrative Assistant, Academic and Student Affairs*
 Karen E. McGuire, B.S., M.Ed., *Director, University College Placement*
 John J. McKenna, B.S., M.A., *Assistant Director, Administrative Services*
 Dorothy A. Meckel, A.B., M.A., Ed.D., *Assistant Director for Publications and Research*
 Lana B. Melnik, B.S., *Administrative Assistant, Health Professions Programs*
 Timothy F. Moran, B.S., M.Ed., *Associate Dean and Director of Law Enforcement, Corrections, and Security Programs*
 Robert W. O'Connor, A.B., Ed.M., Ed.D., *Associate Dean for Academic Programs*
 Dorothy M. Oppenheim, B.A., M.B.A., *Assistant Dean and Director of Business Administration Programs*
 Marie T. Pellegriti, B.S., *Administrative Assistant, Registrar's Office*
 Jacqueline Platt, B.S., M.Ed., *Assistant Director, Suburban Campus, and Director of Counseling, Burlington*
 John H. Robbins, Jr., B.A., M.Ed., *Associate Dean, Director, Center for Continuing Education*
 Kenneth C. Solano, A.B., M.Ed., *Associate Dean, Associate Director, Center for Continuing Education*
 Joseph F. Suszynski, B.S., *Assistant Director, Academic and Student Affairs*
 Gretchen M. Thompson, B.A., *Director, Academic and Student Affairs*
 David B. Thornton, B.S., *Associate Registrar*
 Ralph T. Vernile, Jr., B.S., *Associate Dean for Administration*
 Stephen M. Wage, B.A., M.S., A.R.R.T., *Assistant Director of the Radiologic Technology Program*
 Marilyn S. Wiener, A.B., M.A., *Associate Dean and Director of Humanities and Social Science Programs*
 Richard L. Wilson, B.A., B.S., M.Div., Ed.M., *Assistant Director, Academic and Student Affairs*

Executive Committee

John W. Jordan, Chairperson
 Richard J. Comings
 Timothy F. Moran
 Robert W. O'Connor
 Dorothy M. Oppenheim
 John H. Robbins, Jr.
 Gretchen M. Thompson
 Ralph T. Vernile, Jr.
 Marilyn S. Wiener

Committee on Academic Standing

William T. Edgett, Chairperson
 Timothy F. Moran
 Robert W. O'Connor
 Dorothy M. Oppenheim
 Gretchen M. Thompson
 Marilyn S. Wiener
 John W. Jordan, *Ex Officio*

Law Enforcement Curriculum Committee

Timothy F. Moran, Chairperson
 Richard D. DeBoer, Jr.
 Francis R. Hankard
 Robert F. Johnson
 Joseph M. Jordan
 Robert W. O'Connor
 Howard R. Palmer
 Carmen S. Pizzuto
 Daniel A. Welch
 Three Student Representatives
 John W. Jordan, *Ex Officio*

Arts and Sciences Curriculum Committee

Marilyn S. Wiener, Chairperson
 Samuel S. Bishop
 Eugene J. Blackman
 Robert L. Cord
 E. Wallace Coyle
 Neil F. Duane
 Harold M. Goldstein
 Edward A. Hacker
 Wilfred Holton
 Joshua R. Jacobson
 Charles Karis
 Philip W. Lequesne
 Marvin X. Lesser

Robert W. O'Connor
 Holbrook C. Robinson
 Raymond H. Robinson
 Fred A. Rosenberg
 David L. Wilmarth
 Michael L. Woodnick
 Three Student Representatives
 Three Part-Time Faculty Representatives
 John W. Jordan, *Ex Officio*

Library Committee

Richard J. Comings, Chairperson
 Marvin X. Lesser
 Timothy F. Moran
 Dorothy M. Oppenheim
 John W. Jordan, *Ex Officio*

Health Professions Curriculum Committee

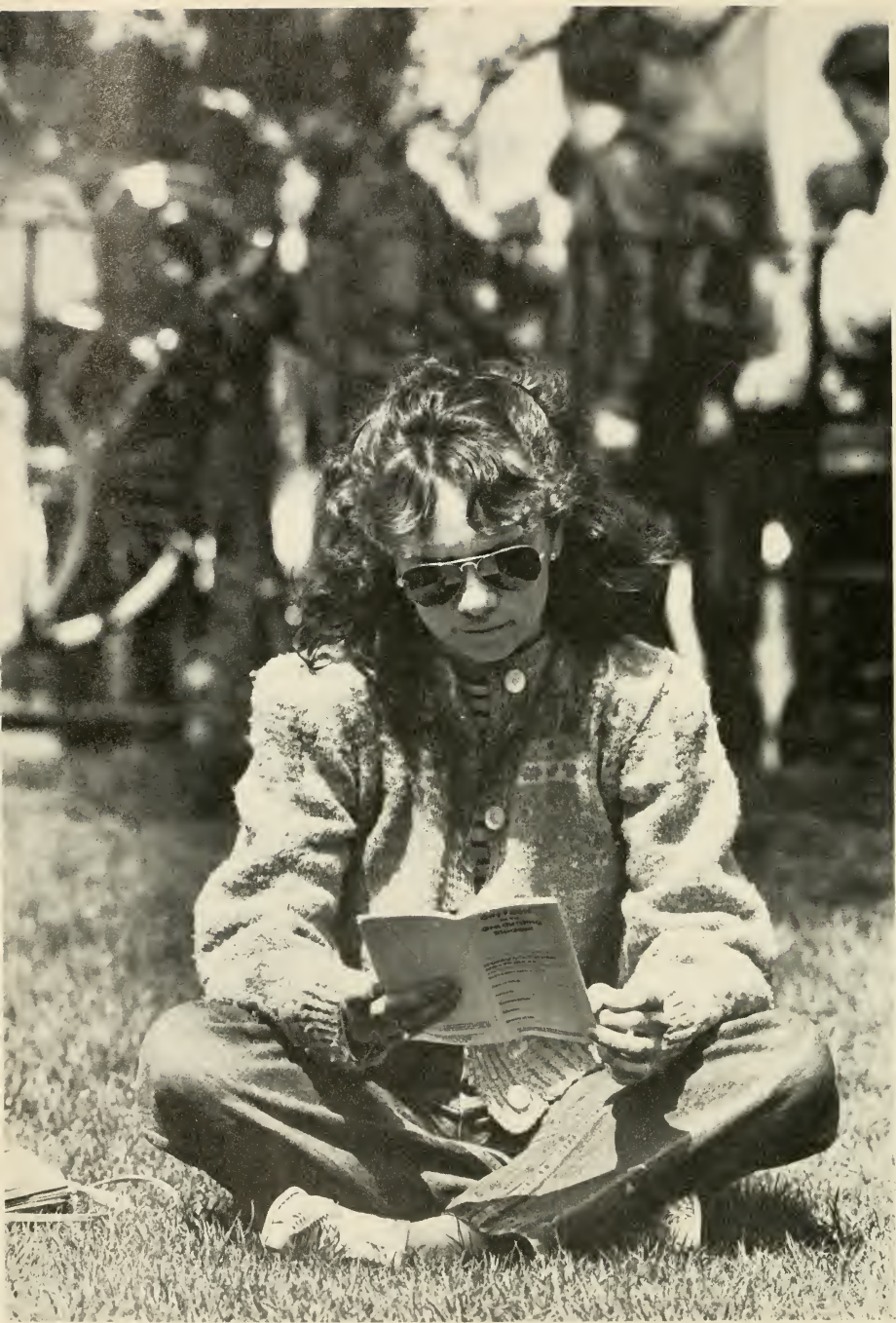
Robert W. O'Connor, Chairperson
 Theodore Blank
 Stanley A. Bozen
 Annalee Collins
 Gerald L. Davis
 Philip S. DiSalvio
 Judith Weilerstein
 Two Student Representatives
 Two Faculty Representatives
 John W. Jordan, *Ex Officio*

Therapeutic Recreation Curriculum Committee

Robert W. O'Connor, Chairperson
 Jacalyn S. Hamada
 Frank M. Robinson, Jr.
 Two Student Representatives
 John W. Jordan, *Ex Officio*

Business Administration Curriculum Committee

Dorothy M. Oppenheim, Chairperson
 W. Arthur Gagne
 Robert L. Goldberg
 Ronald E. Guittarr
 Robert J. Hehre
 Thomas J. McNamara
 Robert W. O'Connor
 Joel M. Rosenfeld
 Three Student Representatives
 John W. Jordan, *Ex Officio*



Office of Academic and Student Affairs

Gretchen M. Thompson, Director, Academic and Student Affairs

William T. Edgett, Academic Adviser, Assistant Director

Carol L. Fulton, Academic Adviser, Assistant Director

Kathleen H. Hayes, Career Counselor, Assistant Director

Jacqueline Platt, Academic Adviser, Assistant Director, Burlington Campus

Joseph F. Suszynski, Academic Adviser, Assistant Director

Richard L. Wilson, Academic Adviser, Assistant Director

Karen E. McGuire, Director, University College Placement

Janet F. Doyle, Assistant Director

Academic Policies

Admission and Registration

Matriculation: Becoming a Degree Candidate

Graduation Requirements

Transfer Credit Policy

Grading System

Attendance, Homework, and Examinations

Miscellaneous Policies

See pages 26–33 for further information.

Telephone: 617-437-2400

Career and Academic Counseling Services

New Student Open Houses

Academic Advisers

Tutorial Services

Career Counseling

Self-Assessment and Career Development

Job-Search Seminars

Cooperative Education

Core Career Courses for Women

Counseling and Testing Services

Placement

See pages 34–36 for further information.

Telephone: 617-437-2400

Academic Policies

Admission and Registration

Open Admission University College has an open admission policy. This policy allows students to enroll in most courses simply by registering for the course. It is not necessary to submit a formal application for admission, nor are entrance examinations or College Board Examination scores required.

The open admission policy applies equally to nondegree students and to those who intend to obtain an undergraduate degree at University College. Many students enroll in courses at the College for personal enrichment or to gain specific career-related skills. Credits earned for these courses may be applied to a degree program if the student desires to pursue a degree at a later time. In some cases, nondegree students already have an undergraduate degree and are interested in specific courses for their continuing education. Nondegree students are considered members of the University College community and are entitled to the student support services offered by the College. Students who decide to pursue a degree program at University College will eventually need to become matriculated into the College. See page 27 for further information about the matriculation process. Special matriculation requirements apply to students entering the Bachelor of Science in Business Administration degree program. For detailed information about the matriculation process for this program, please see pages 48–49.

Registration Students may register for courses by reporting to any of the College's sixteen campuses during the registration periods that are scheduled each quarter. It is not necessary to register at the campus where a particular course actually meets; students may register at any campus for a course scheduled at any other campus. All students must complete a registration form before attending class; attendance at class, even with the instructor's permission, does not constitute registration. No academic credit will be awarded to students who are not properly registered. See the Academic Calendar on pages 6–8 for a complete registration schedule.

Not all the courses listed in this *Bulletin* are offered each quarter. A complete list of the

courses offered in any particular quarter is contained in the University College *Schedule Guide* for that quarter. A *Schedule Guide* is distributed for the Fall, Winter, Spring, and Summer quarters at all campuses or by mail upon request (telephone 617-437-2400).

Help with Course Selection Academic advisers (see page 34) are available throughout the year by appointment to help students plan their academic programs and select courses. Students who have earned credits from other schools are urged to have their transcripts evaluated prior to the registration period to avoid registering for courses that duplicate work completed at other educational institutions. Advisers are also available without appointment to answer general questions during the official registration periods at all campuses.

Before registering for a course, students should read the course description in this *Bulletin* to determine if it is necessary to have taken a prior or prerequisite course. In order to ensure academic success, students are strongly advised to adhere to course prerequisites.

Placement Tests Students registering for mathematics courses offered by Lincoln College must take a mathematics placement test given during registration. Students registering for Mathematics 1 (10.627) may also take the placement test on the first night of class. Students registering for College Algebra 1 (10.607), however, must have taken the placement test during registration to be admitted to class. Students who have taken introductory Mathematics courses 10.681 and 10.682, or 10.691 and 10.692, must have evidence of successful completion to register.

Students enrolling in English 1 will be asked to complete a brief writing sample at their first class meeting. Based on this sample, their instructor may refer them to a more basic course in English composition.

International Students Northeastern University is authorized under Federal law to enroll nonimmigrant alien students. For information regarding eligibility to enroll in University College, contact Joseph Suszynski in Room 102 Churchill Hall, telephone 617-437-2400, or the International Stu-

dent Office in 270 Holmes Hall, telephone 617-437-2310.

Maximum Course Load New students may elect up to 12 quarter hours per quarter without special permission from the appropriate Program Director. Former students who are not on the Dean's List may also elect up to 12 quarter hours per quarter without special permission. Students who are on the Dean's List may elect a maximum of eighteen quarter hours per quarter without special permission.

Class Changes University College reserves the right to cancel, divide, or combine classes when necessary. While this policy ensures that students will almost never be excluded from a class because it is oversubscribed, it also means that a course may occasionally be canceled because of inadequate enrollments. Cancellations are more likely to occur among upper-level or advanced courses than among introductory courses. To avoid course cancellations, students are urged to register early.

Pass/Fail Courses Students may register for one *elective* course per quarter on a pass/fail basis. To be eligible for pass/fail status in a course, the student must be in good academic standing (not on academic probation) and must have completed thirty-nine quarter hours of academic work. Thereafter, the student may register for one pass/fail course for each fifteen quarter hours of successfully completed work. The student must also meet all prerequisites for the courses.

To be graded on the basis of pass/fail, the student must obtain a Pass/Fail Permission Card signed by the Program Director for his/her program of study. This card must then be brought to the instructor of the course. In addition, the Registrar must be notified in writing by the student of the student's intention to take the course on a pass/fail basis prior to the fourth meeting of the course.

Auditing Policy Students are permitted to audit courses, but they must complete the usual registration forms and pay regular tuition fees. There is no reduction in fees for auditing. An auditor may participate in class discussion, complete papers and projects, and take tests and examinations for informal evaluation. However, regardless of the amount or quality of work completed, **no academic credit will be granted at any time for audited courses.**

The student's decision to audit a course must be communicated in writing to the Registrar prior to the fourth meeting of the course. No exception to this procedure can be approved without authorization by the Academic Standing Committee of the College.

Withdrawal Policy A student who wishes to withdraw from a course must complete a Course Drop form in the Registrar's Office or notify the Registrar in writing of his or her intention to withdraw prior to the week in which final examinations are given. The forms are available at all campus locations. If, after the first class meeting, a student misses three consecutive class meetings of a course, he or she will automatically be withdrawn from the course by the Registrar. If, by the ninth or tenth week of the quarter, the Registrar examines the attendance book and has every reason to believe that the student has dropped the course, the student will be officially withdrawn, and his or her withdrawal will be noted in the attendance book.

Students who withdraw or are withdrawn from a course will have no record of the withdrawal on their transcripts. (See page 38 for information on tuition refunds.)

Matriculation—Becoming a Degree Candidate

Matriculation, the procedure for becoming a degree candidate, is mandatory for all students intending to pursue a degree program at University College. The procedure for matriculating is initiated by filing a Petition for Matriculation with the Office of Academic and Student Affairs or at any branch campus office. The petition may be requested by telephone (617-437-2400), and the completed form returned by mail to the Office of Academic and Student Affairs, 102 Churchill Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115.

To be eligible for matriculation, a student must complete at least eighteen hours of credit at University College, including the satisfactory completion of English 1, 2, 3 (30.305, 30.306, 30.307) or their equivalent. The student must be a graduate of a regionally accredited high school or secondary school (an institution having recognition and membership in one of the six regional accrediting associations recognized by the Council on Post-secondary Accreditation) or possess a High School Equivalency Certificate. The student must have a residence quality point average of at least 2.0 (a C average at University College) and must maintain this minimum quality

point average to continue as a matriculated student.

Matriculation Requirements for Transfer Students

A student who has petitioned to transfer credits from another regionally accredited institution of higher education (an institution having recognition and membership in one of the six regional accrediting associations recognized by the Council on Post-secondary Accreditation) or from other sources such as CLEP or PEP examinations (see page 29) may matriculate after completion of one quarter in University College, provided a total of 18 hours of credit have been completed from all sources. (See page 29 for procedures for transferring credit from another institution.) The English 1, 2, 3 (30.305, 30.306, 30.307) requirement or the equivalent must be satisfied as well as high school or secondary school graduation or possession of a High School Equivalency Certificate. The student must have a residence quality point average of at least 2.0 (a C average in University College) and must maintain this minimum quality point average to continue in a matriculated status.

Graduation Requirements

Except for certain Health Professions Programs, the requirement for graduation from University College is 174 quarter hours for a bachelor's degree and 96 quarter hours for an associate's degree, with attainment of a quality point average of 2.0 (an average grade of C). Although the credits allowed for acceptable work completed elsewhere by transfer students count toward fulfillment of quantitative graduation requirements, neither the credits nor the grades earned in such courses are included in the quality point computations for graduation. Course requirements for each degree are different and are outlined in this *Bulletin*.

Course Substitutions and Waivers Students may request to have a required course in an academic program waived and to substitute another course in place of the required course. Such requests are not encouraged, although the University recognizes that students may occasionally have very good reasons for requesting such waivers. To request that a required course be waived, students must complete a General Petition form and submit this form to the Office of Academic and Student Affairs. Course petition forms are available in 102 Churchill Hall and at all branch campus locations. All petitions for course waivers are routinely forwarded to the Director of the ac-

ademic program in which the student is matriculated. The Program Director in turn makes a recommendation concerning the request for the waiver to the University College Committee on Academic Standing. All required course substitutions and waivers of program requirements must be approved by the Committee on Academic Standing.

Graduation with Honor Candidates who have achieved distinctly superior attainment in their academic work will be graduated with honor. Upon special vote of the faculty, a limited number of this group may be graduated with high honor or with highest honor. To be considered for graduation with honor, a student must have completed a minimum of 72 quarter hours of work at University College. Courses transferred from other educational institutions will not be considered in determining honor graduates.

Residence Requirement Every candidate for the bachelor's or associate's degree must fulfill the minimum residence requirement. The residence requirement is defined as the satisfactory completion of at least 45 quarter hours of course work in University College immediately preceding graduation. At least 12 of the 45 quarter hours must be in the candidate's major field of study.

Since the University College residence requirement prescribes the completion of at least 45 quarter hours of credit in residence immediately preceding graduation, a student who intends to graduate in any academic year may not use courses at any other institution for the purpose of transferring credit.

A student whose enrollment in a degree program is interrupted for a period of one year or more will be reinstated in the program at the time of re-entry into University College.

In Absentia Status If a student moves beyond a reasonable commuting distance from University College or its branch campuses but has completed 135 or more quarter hours of credit (including a maximum of 60 quarter hours of transfer credit), the Committee on Academic Standing will consider a petition to allow the student to complete his or her requirements for a University College degree at another approved college. The courses remaining must be completed within two years from the date of official approval of the student's in absentia status.

Senior Status Procedure All potential graduates will be polled during the Fall quarter to de-

termine their intention to graduate during the current academic year. To be considered for graduation in June, a student must return a Commencement Data Card prior to the start of the Winter quarter of the academic year in which he or she expects to graduate. September graduates will be polled during the month of June.

Throughout the academic year, the Office of Academic and Student Affairs issues Senior Status Reports on request to potential graduates in order to assist them with the selection of courses required for program completion. Seniors are encouraged to request a Senior Status Report during the summer prior to the academic year in which they plan to graduate. Petition forms for status reports are available in 102 Churchill Hall on the Boston Campus and at the main office of each branch campus.

Credit by Examination During the Senior Year CLEP or PEP examinations (see below) may be taken by students during their final year of study provided they have met the 45-quarter-hour residence requirement for graduation (see p. 28). Because of the time required for CLEP and PEP exams to be graded and scores returned to the University, students requesting June graduation must take their CLEP and PEP exams no later than the Winter quarter of their senior year.

Transfer Credit Policy

Transfer Credit from Another Institution Students may transfer credit from accredited institutions of higher education when courses completed are applicable to the student's program in University College. The minimum course grade acceptable for transfer credit is C, or 2.0 on a four-point scale. An accredited institution of higher education is an institution having recognition and membership in one of the six regional accrediting associations recognized by the Council on Post-secondary Accreditation.

Transfer Credit Procedure A student who wishes to obtain a tentative evaluation of credits earned from another institution must file an Advanced Standing Credit Petition with the Office of Academic and Student Affairs. The student must then write to the Registrar of the institution previously attended and request that an official transcript (one bearing that institution's seal) be forwarded to the Office of Academic and Student Affairs, 102 Churchill Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115. The transcripts should indicate courses completed, credits, and grades earned.

Upon receipt of official transcripts, the Office of Academic and Student Affairs will issue a tentative evaluation of all credits as they apply to the student's program in University College. Official awarding of credit will be recorded on the student's University College transcript when matriculation is approved.

Students who have been dismissed from other institutions for academic or other reasons must enclose with their Advanced Standing Credit Petition a statement from the dean or other appropriate official of the previously attended institution stating the reasons for dismissal. The statement must also include a recommendation for acceptance at University College.

Validation of Required Upper-Level Business Courses for Transfer Credit Students entering the Bachelor of Science in Business Administration degree program (new as of September 1983) may be required to validate required upper-level business courses that they have taken outside the framework of the program.

"Validation" is the set of procedures that tests whether an upper-level course completed at the lower division of a baccalaureate program should be accepted for transfer credit in the upper division of a baccalaureate program recognized and approved by the American Assembly of Collegiate Schools of Business. The Bachelor of Science in Business Administration program offered by University College conforms with all standards established by the American Assembly of Collegiate Schools of Business (AACSB). AACSB has been recognized by the Council for Post-secondary Accreditation and by the United States Office of Education as the sole accrediting organization for university baccalaureate and master's degree programs in business administration.

The rationale for validation is based on the distinction between lower-level and upper-level courses. The content and focus of most upper-level courses presupposes a certain amount of prior academic work and general knowledge. Often, students who complete an upper-level course without first having been exposed to the bodies of knowledge presupposed by that course are unable to benefit fully from the upper-level course and therefore fail to develop as much as they should in their understanding of the subject matter. In recognition of this problem, University College has adopted specific validation procedures. Their purpose is to ensure that the knowledge a student has acquired in an upper-level business course completed at the lower division

closely approximates in focus and content the knowledge that University College feels is acceptable for a particular upper-level course in a specific area of study.

Generally, students will be able to validate previously earned course credits by taking a sequential course, a department-approved examination, or a CLEP (College Level Examination Program) or PEP (Proficiency Examination Program) examination.

For further information about course validation, please see page 48. Students should also talk with a University College academic adviser for further information about the validation of upper-level business courses for transfer credit.

Evaluation of International Educational Credentials

Students requesting an evaluation of international educational credentials for transfer credit in University College will be assessed a fee of \$30. The evaluation will be issued by the Office of Academic and Student Affairs upon receipt of an Advanced Standing Credit Petition, official copies of all transcripts translated into English, and a check in the amount of \$30.00, payable to Northeastern University. The official assessment of international educational credentials will be made in accordance with current standards for awarding advanced standing credit at University College or as recommended by the Center for International Higher Education Documentation. The \$30.00 fee will be waived for any University College student who has matriculated prior to requesting the evaluation.

Course(s) at Another College or University

A student who is matriculated in a degree program at University College and who wishes to complete one or more courses at another institution for transfer purposes must obtain written permission from the Office of Academic and Student Affairs prior to enrolling in the course. Courses taken at other institutions may be disallowed unless written permission is obtained in advance. Seniors (students in their final year of study at University College) should refer to information about the residence requirement (see p. 28 for further clarification of this policy).

Credit by Examination University College will award credit by examination provided the examination does not represent a duplication of other previously earned academic credit. Credit is granted for successful completion of examinations currently available through the College Level Examination Program (CLEP) of the College

Entrance Examination Board and through the Proficiency Examination Program (PEP) of the American College Testing Program. Both programs have been designed to assist students in acquiring college-level credit for knowledge acquired through nontraditional means, such as on-the-job training, educational television, correspondence and extension study, and independent study. Information about these programs is available in the Office of Academic and Student Affairs at University College and at the Northeastern University Counseling and Testing Center.

Modern Language Proficiency Examination

Students may be eligible to receive credit for proficiency in a modern language. Examinations are currently offered in French, Spanish, German, Russian, and Italian. Students should contact the Modern Language Department, 360 Holmes Building, telephone 617-437-2234, for information concerning these examinations.

Noncollegiate Experience Credit

Law Enforcement students may be granted up to eighteen hours of credit in their program by successfully completing one or more of the noncollegiate credit examinations that have been made available through their Program Director's office. Examinations are periodically scheduled by the Counseling and Testing Center.

Arts and Sciences students may petition for noncollegiate experience credit through their major adviser if they are matriculated in the Arts and Sciences program with a departmental major. See page 93 (Law Enforcement) and page 69 (Arts and Sciences) for more details on opportunities for noncollegiate experience credit.

Credit cannot be awarded through noncollegiate experience petitions or examinations when an appropriate examination is available through CLEP or PEP.

Credit for Extracurricular Learning

Extracurricular learning is that which takes place outside the sponsorship of legally authorized and accredited postsecondary educational institutions. The term applies to learning acquired from formal courses sponsored by associations, governments, business, and industry.

In awarding credit for extracurricular learning, University College utilizes the *National Guide to Credit Recommendations for Noncollegiate Courses*, published annually by the American Council on Education.

Students applying for credit for extracurricular learning must submit an Advanced Stand-

ing Credit Petition and provide official credentials from the sponsoring noneducational organization to the Office of Academic and Student Affairs at University College. The credit may be applied toward degree requirements at University College if recommended in the *National Guide*, provided credit is not otherwise obtainable through CLEP, PEP, or noncollegiate experience credit programs at University College.

Grading System

A student's work in each course is evaluated by the instructor, who awards a letter grade at the end of the quarter. This grade is officially recorded by the Registrar's Office. The grades and symbols used are given below, together with the numerical equivalents used for computing quality point averages:

A	(4.0)
A-	(3.667)
B+	(3.333)
B	(3.0)
B-	(2.667)
C+	(2.333)
C	(2.0)
C-	(1.667)
D+	(1.333)
D	(1.0)
D-	(.667)
F	(0)
I	Incomplete
L	Audit (No Credit)
S	Satisfactory (Pass/Fail Grade)
U	Unsatisfactory (Pass/Fail Grade)
X	Incomplete (Pass/Fail Grade)
*	Grade not received

Grade Reports and Transcripts All efforts will be made to mail grades prior to the beginning of the following quarter. A supplementary grade report will be issued when a missing grade or a grade change is received. University regulations prohibit issuing grades by telephone. Grade reports of matriculated students indicate both their quarterly quality point average and their cumulative quality point average.

Students may obtain a transcript of their grades by making a request in writing to the Registrar's Office, 120 Hayden Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115. Unofficial transcripts are issued free of charge; official transcripts that bear the University seal cost two dollars.

Quality Point Average The method of figuring the quality point average is as follows: the numerical equivalent of each grade received is multiplied by the credit hours earned; the quality points are added together, then divided by the student's total quarter hours. An example follows:

Grade Achieved	Numerical Equivalent	Credit Hours	Quality Points
A	4.0	3	12.0
B-	2.667	3	8.0
C	2.0	6	12.0
F	0.0	3	0.0

$$\text{Quality Point Average} = \frac{\text{Total Quality Points (32.0)}}{\text{Total Credit Hours (15)}} = 2.13$$

Pass/Fail grades (S, U, and X), Incompletes (I), and Audits (L) are not included in the quality point average. Similarly, transfer credits are not included in quality point averages. The total earned hours appearing on the student's transcript, however, include both transfer credits and S grades.

A cumulative grade point average below 2.0 is unacceptable and will not allow a student to continue in University College or to receive a degree from Northeastern University. The F grade is a definite failure and requires repetition of the course in its entirety. A student whose academic performance in any given period is unsatisfactory may be dropped from the College or placed on probation.

The I Grade The I grade, or Incomplete, may be given only when the student fails to take the final examination for a course. An instructor may decide that a student has done so poorly in the course that even a perfect grade in a make-up final examination could not raise the grade from F; in this case F is the proper grade, regardless of the missed final examination.

If the student fails to complete some other major portion of the course work (examination, quizzes, major paper, etc.) a letter grade is assigned. This grade can be changed when the deficiency that led to the assigned letter grade is made up to the satisfaction of, and in the manner prescribed by, the instructor.

All deficiencies must be made up in the prescribed manner no later than twelve months following the recording of the grade. Students requesting an exception to this policy must petition the Academic Standing Committee of Uni-

versity College in writing. A student may also elect to repeat the course at his or her expense.

Pass/Fail Grades Satisfactory completion of work in all courses taken on a pass/fail basis will be designated on the transcript by the letter "S." Unsatisfactory work will be designated on the transcript by the letter "U." Any unsatisfactory grade must be handled according to the existing policy of University College but may never be cleared by enrolling in the same course on the basis of the pass/fail system of grading.

An Incomplete in a course taken on a pass/fail basis will be designated by the letter "X" on the transcript and will be treated according to the normal procedure for grades of Incomplete.

Dean's List All matriculated students who have taken a minimum of twenty-seven quarter hours in three consecutive quarters (for example, Fall, Winter, Spring) and who have completed all their courses with a quality point average of 3.0 or better shall be placed on the Dean's List. These students receive certificates of commendation from the Dean of University College. See page 28 for information about graduation with honor.

Attendance, Homework, and Examinations

Students are expected to attend all meetings of the classes in which they are registered unless excused in advance. Absence from regularly scheduled classes will seriously affect the student's academic standing. A student who is consistently absent from class will be withdrawn from the course by the Registrar.

Absence Because of Illness All students who are absent from school because of extended illness and who do not wish to be withdrawn should inform the Registrar's Office in writing.

Homework The specific work required for each course in University College is determined by the instructor. In general, it is expected that University College students will spend an average of six to eight hours per week outside of class on assignments for each course. Students who are absent are responsible for obtaining their homework assignments from their instructors or other students in their classes. Homework assignments are not available in the Office of Academic and Student Affairs.

Examinations Tests are scheduled throughout each quarter at the option of the instructor and are regarded as part of the term's course work. A final examination is held at the end of each

quarter in each course unless an announcement is made to the contrary.

Missed Final Examinations A student who misses a final examination will be given a grade of I (Incomplete). A student does not automatically have the right to make up a missed final examination. Students must petition for this privilege and must pay a fee of \$25.00 for each make-up examination. Petitions are available in 102 Churchill Hall and at all suburban administrative offices. Petitions are available for four weeks after the term has ended. After submitting petitions, students will be notified of the time and location of make-up examinations.

Students who make up a missed final exam will have a letter or pass/fail grade substituted as appropriate for the I grade on their transcripts.

Miscellaneous Policies

Students' Rights and Responsibilities The University subscribes to the view that all students have certain rights and freedoms. For these reasons, the University has adopted and published specific policies and procedures governing the following matters: students' rights and freedoms, general conduct, student discipline, disclosure of information from students' records, and University judicial procedures. Judicial procedures are related to issues of discipline and conduct, the right of students to appeal judgments of their academic performance, grievances based on the fact that a student is handicapped, and allegations of sexual harassment. All policies and procedures governing the above matters may be found in the *University College/Lincoln College Student Handbook*. Copies are available in 102 Churchill Hall at the Boston campus, telephone 617-437-2400. Copies are also generally available at each of the University's branch campus locations.

Family Educational Rights and Privacy Act In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits students to inspect their records whenever appropriate and to challenge specific parts of them when they feel it necessary. Specific details of the law as it applies to Northeastern are available in the *University College/Lincoln College Student Handbook*.

Disciplinary Action The Committee on Regulations and Discipline has the authority to dismiss from the College, place on probation, or remove from the list of degree candidates any student

who, because of disruptive or illegal conduct or poor character, is considered an unsuitable member of the College community. The Committee on Regulations and Discipline is an ad hoc subcommittee of the University College Committee on Academic Standing. It is convened at the request of the Committee on Academic Standing.

Change of Address Change of address and/or name should be reported in writing immediately to the Registrar's Office, 120 Hayden Hall, Northeastern University, 360 Huntington Avenue, Boston, Massachusetts 02115.

Attendance at Commencement Attendance at commencement for all University College degree candidates is optional. Degree candidates will be polled regarding their intention to attend commencement by the Northeastern University Commencement Committee during the Spring quarter.

Changes in Requirements The continuing development of University College requires frequent revisions of the curricula. When no undue and unusual hardship is imposed on students because of these changes, students are expected to meet the requirements of the most current *Bulletin*. If a particular student finds it impossible to meet those requirements, the *Bulletin* for the year in which he or she first entered University College is binding. **Note:** Students who are planning to pursue a bachelor's degree in business and who will have obtained fewer than 88 quarter hours of credit by September 1983 will be required to pursue the new Bachelor of Science in Business Administration degree program.

Academic programs, course content, and rules and regulations are subject to change without notice.

Career and Academic Counseling Services

Through a wide variety of career and academic counseling services, University College is prepared to assist students in making both educational and career decisions. The College does this in several ways; by providing academic advisers and career counselors; by offering credit and noncredit career-planning workshops and special programs; and by serving as a link to other student support services offered by Northeastern University.

The services, courses, and programs outlined on the following pages have been designed with specific educational and/or career-planning issues in mind. Students are urged to read this section carefully.

New-Student Open Houses

Individuals who are thinking about enrolling in University College for the first time are encouraged to attend an Open House. An Open House introduces potential students to the many University College programs and services designed to meet the educational, job-related, and personal needs of adult part-time students. The Open House also orients new students to the University as a whole and addresses concerns that many students have about:

- choosing courses and registering
- securing financial aid
- obtaining career or personal counseling
- managing work, school, and family responsibilities.

Persons interested in a degree program will have an opportunity to speak with advisers about matriculation requirements, transfer of credit from other colleges, and additional procedures for becoming a student at University College.

Open Houses are ordinarily scheduled each quarter at selected campus sites at or about the same time that registration takes place. Since space is limited, students are urged to express their interest in attending an Open House prior to any given registration period. (See the Academic Calendar on pp. 6–8 for a complete registration schedule.) Persons wishing to attend an Open House should notify the Office of Academic and Student Affairs by telephoning 617-437-2400.

Academic Advisers

Academic advisers are available day and evening by appointment in the Office of Academic and Student Affairs. They are competent to assist students in planning a program suitable to their educational and career objectives. Advisers can also answer questions relating to degree requirements, course sequences, and proper scheduling of courses. Appointments may be arranged by telephoning the Office of Academic and Student Affairs at 617-437-2400 or by coming in person to 102 Churchill Hall at the Boston Campus. There is no charge for this service.

Academic advisers are also available without appointment to answer general questions during registration periods at all campuses. Throughout the year, academic advisers are available by appointment at satellite campuses. All appointments are arranged through the Office of Academic and Student Affairs at the Boston Campus, telephone 617-437-2400.

Tutorial Services

Through the Office of Academic and Student Affairs, University College offers tutorial assistance in English, mathematics, accounting, economics, and statistics. Tutoring, which is on a one-to-one basis, provides an opportunity for student and tutor to focus on specific problems that might not have been covered during class time. Students may request tutorial information from Joseph Suszynski, Room 102 Churchill Hill, telephone 617-437-2400. A flyer describing tutorial services is also available in Room 102 Churchill Hall and at all suburban locations.

Career Counseling

Students in need of career counseling may telephone 617-437-2400 to arrange an appointment with a career counselor. This service is designed for students who need help in choosing a career or in developing effective job-hunting strategies. A career counselor will also explain to students and help them utilize additional services and programs offered by University College and by other offices at Northeastern University.

Self-Assessment and Career Development

One of the strongest motivations for continuing your education is the desire for career advancement or change. In order to help you develop career and educational planning skills, University College offers two three-credit courses in career development. Self-Assessment and Career Development 1 (90.401) is designed for persons who feel undecided about a career choice and who need help in defining career and educational objectives for themselves. Self-Assessment and Career Development 2 (90.402) is an advanced job-hunting-skills course for persons who are sure of the career area in which they wish to pursue job opportunities. For complete descriptions of these career development courses, see page 210.

Job-Search Seminars

Each quarter the Placement Office and the Office of Academic and Student Affairs offer a series of evening two-hour Job-Search Seminars. The seminars are specifically designed for students who have identified the field or career area in which they would like to work. Students planning to participate should currently be looking for a job or be anticipating a job change in the near future.

These seminars are intended to help students assess their skills, define their immediate career direction, develop effective job-search strategies, write résumés, and prepare for job interviews. Seminar schedules are announced in the *Student Newsletter* and in classes two weeks prior to each seminar series. Students wishing to participate in the Job-Search Seminars must reserve a place in the seminars by calling the University College Placement Office at 617-437-2428.

Cooperative Education Program

University College, in conjunction with Northeastern University's Division of Cooperative Education, has developed a program in cooperative education for matriculated part-time students.

Most students attending University College are employed on a full- or part-time basis. Unfortunately, many University College students find themselves working in jobs that are unrelated to the specific job and career interests reflected in the programs of study they have chosen to pursue. The University College co-op program has been designed to address this problem by helping students enter jobs in work environments that are related to their particular fields of study. Co-op jobs are usually of six to nine months' duration.

In addition to gaining work experience in a setting related to their field of study, students can benefit in other ways from the University College co-op program, including opportunities to:

- explore and select career areas consistent with their values, skills, interests, and abilities
- identify further academic courses appropriate to their vocational objectives
- develop job-finding skills
- enter the work force, reenter the work force, make a career change, or gain upward mobility.

A further and very important objective of the University College co-op program is to help each student find ways to use the work experience gained in a co-op job as a springboard to a more permanent position in the field or career area he or she has chosen. To help facilitate this goal, each co-op student's overall performance will be evaluated by the student's employer and a Northeastern co-op coordinator. This evaluation is shared with the University College placement counselor who is available to help University College students find permanent jobs after they have completed their co-op work experience.

Each quarter, a limited number of students are selected on a competitive basis for the University College co-op program. They are normally placed on co-op jobs during the following quarter.

Only matriculated students (i.e., students who have been accepted by University College to work toward a degree) may apply for co-op. Applicants are selected on a competitive basis. To apply, a student must have completed a minimum of sixty (60) quarter hours of academic credit and have met with a University College career counselor.

Further information For a brochure containing further detailed information on the University College cooperative education program, including important deadlines, please call 617-437-2428.

Core Career Courses for Women

University College offers a special group of personal assessment and career development courses for women interested in a business career. Through Core Career Courses, women learn to match their skills and competencies to those needed in specific career areas in business. This process, in turn, helps a woman determine which specific jobs in business she is most suited to pursue. The Core Career Courses are also designed to acquaint women with the organizational

dynamics of business settings and to help them develop a basic understanding of the quantitative and technical skills needed for various career areas in business.

A complete list of Core Career Courses may be found on page 210. All Core Career Courses are open to any interested student.

Counseling and Testing Services

Philip W. Pendleton, Director of the Counseling and Testing Center.

Donald K. Tucker, Specialist in Adult Counseling

Location: 302 EII Building

Telephone: 617-437-2142

Hours: Monday–Friday, 8:30 a.m.–4:30 p.m.

Tuesday, Wednesday, Thursday,

5:30 p.m.–8:30 p.m., Oct.–May

The Counseling and Testing Center at Northeastern provides a wide variety of services free of charge to all part-time students. Services for University College students include:

Personal Counseling This involves discussing with a counselor such concerns as adjusting to being a student (again or for the first time), getting along with people, feeling anxious or depressed, as well as problems centered around family, sex, drugs, or alcohol.

Educational-Vocational Counseling This involves assisting students in making decisions about choice of major and/or career. It typically involves an in-depth look at one's self, including strengths, aspirations, and values. Tests are often helpful in the process of self-understanding. The kinds of tests available include interest, ability, personality, and aptitude. This kind of planning is usually done individually with a counselor, although small groups may be organized if this approach seems more appropriate.

The goals of the Center's educational-vocational planning service are complementary to those of the University College career-planning courses. Therefore, interested persons are encouraged to explore both options for career exploration and planning and then choose the service that seems best suited to their needs.

Study Skills Workshops (Available during the day only) Workshops are offered periodically to assist students in becoming more effective in organizing their time, in note taking, in preparing for and taking exams, and in other areas related to effective academic performance.

Career and Graduate School Information The Center maintains a reference room with information on a wide variety of careers and graduate and professional schools.

Placement

The University College Placement Office of Northeastern's Department of Career Development and Placement provides a number of free career placement services to University College students. Among the services provided to all students are a reference library of employer information, a job bank of employment opportunities, evening job-search seminars, and seminars on careers of interest.

Students who are enrolled in a degree program are eligible for additional career services such as job placement counseling, nonpaid internships, placement registration, and résumé referral to employers. In addition, seniors may take advantage of corporate on-campus recruiting (daytime) during the Fall and Winter quarters and a credential service for persons applying to graduate school.

The Placement Office is open at least one evening a week in addition to regular daytime hours and is located in 133 Nightingale Hall. For further information students should call the University College Placement Office at 617-437-2428.

Tuition and Fees

Tuition and fees are refundable only as stated under "Refund of Tuition." Checks and drafts for all charges are to be made to the order of North-eastern University.

Tuition for Courses in Other Departments or Colleges of the University

University College students assigned to courses in other departments or colleges of the University are charged the tuition fees effective in the departments or colleges in which they are enrolled.

Initial Registration Fee

A nonrefundable \$10 registration fee, required of all new students, is due and payable upon registration.

Tuition

Tuition for all credit courses is \$72 per quarter hour of credit. Charges for registration and tuition for special courses are at the rate specified for each course. There is no reduction in fees in auditing courses.

Noncredit courses are charged at quarter hour rates comparable to those of credit courses meeting on an equivalent contact hour schedule.

Students are not permitted to attend class sessions or take any examination or test until they have paid their tuition fees or have made satisfactory arrangements for payment.

It is the student's responsibility to ensure that all tuition charges and fees are paid when due. If a bill has not been received prior to the start of classes each quarter, the student should come in person to the Bursar's Office, where a bill will be processed.

Any discrepancies in billing should be immediately brought to the attention of the Bursar's Office. If there is a billing problem, the undisputed portion of the bill should be paid on time to avoid any additional late fees. Failure to receive a bill through the mail or to pay the undisputed portion of the bill are not justification for late payment of amounts actually owed.

Students will not be advanced in class standing or permitted to reenroll in the University nor will degrees be conferred until all financial obligations to the University have been met.

Tuition Budget Payment Plans Occasionally situations develop—usually beyond the control of the student—that make it difficult to meet the payments in the manner outlined above. Under such circumstances the student is advised to contact the Bursar's Office, where a deferred payment agreement may be worked out. The only deferred payment plan offered is as follows and applies only to the amount owed for the current quarter:

1st payment $\frac{1}{3}$ due 1st week of quarter
 2nd payment $\frac{1}{3}$ due approx. 4th week of quarter
 Balance $\frac{1}{3}$ due approx. 8th week of quarter

Such arrangements should be made before the end of the first week of the quarter or within one week of the date of registration if the student enters late. Deferred payment of tuition entails a fee of \$10, which is levied on all accounts not paid by the end of the second week of classes. Failure to take immediate action will result in a late payment fee of \$50.

Tuition Underwritten by Employers An increasing number of companies are underwriting part or all of the cost of tuition of students in their employ. In cases where payment is to be made directly by the employer to the University, the student should furnish the Bursar's Office with a purchase order covering registration or a statement from an officer of the company certifying that the company is underwriting the tuition. In cases where students are being reimbursed by their employer, tuition must be paid by the student according to the prescribed regulations to avoid late payment charges.

Veterans' Benefits Any veteran covered by Public Law 89-358 should report to Room 116 Hayden Hall to fill out the proper enrollment forms.

Late Payment Fee Bills for tuition and fees are payable in accordance with the due date shown. A late payment fee of \$50 will be charged for failure to make payments in accordance with the prescribed regulations.

Refund of Tuition The general policy in all schools and colleges of the University with respect to refunds of tuition is as follow:

The University provides all instruction on an academic quarter basis for which students pay at the beginning of each quarter. Tuition refunds will be granted through the first four weeks of a quarter only when specific conditions are met. Questions regarding refunds should be discussed with the Bursar.

Tuition refunds will be granted only on the basis of the date appearing on the official withdrawal application when filed with the Registrar in Room 120 Hayden Hall. Nonattendance does not constitute official withdrawal.

Refunds will be granted in accordance with the following schedule:

Official withdrawal filed within	Percentage of tuition
1st week of quarter	100%
2nd week of quarter	75%
3rd week of quarter	50%
4th week of quarter	25%

Fees

Student Center Fee All students in University College on the Huntington Avenue Campus are charged \$.75 each quarter for the services available in the Student Center.

Laboratory Fee Students enrolled in courses that carry a laboratory fee must purchase a Laboratory Fee and Deposit Card from the Bursar's Office (\$5 for extra cards).

A fee of \$30 is charged for biology courses and a fee of \$25 for health professions courses that include a laboratory. For chemistry courses the cards cost \$30 per quarter with the possibility of a \$5 refund at the end of the quarter, depending upon breakage. Upon completion of the course or withdrawal during the quarter, the student must check his or her status with the laboratory attendant. The Bursar's Office will then refund any unused balance shown on the Laboratory Fee and Deposit Card.

A laboratory fee of \$25 is charged for film and photography courses and may be charged for an art studio course, if the instructor deems it necessary. A \$25 fee is also charged for the food preparation course in the Hotel and Restaurant Management program.

A laboratory fee of \$25 is charged for arts and crafts courses and for Law Enforcement students who enroll in Forensic Laboratory.

Music students enrolled in an instrument tutorial pay a special rate. For details contact Edgar Weiss, University College Music Coordinator,

Room 307 Ell Building, telephone: 437-2440 or -2442.

Graduation Fee The University graduation fee, charged to those who are candidates for the baccalaureate or associate degree, is \$25, payable on or before May 1 of the year in which the student expects to graduate.

Missed Final Examination Fee Students absent from the regularly scheduled final examination at the end of a course may petition for a "Missed Final Examination." The fee for each examination requested by the student is \$25. The fee must be paid when the petition is filed in the University Registrar's Office.

Transcripts

Students may request official transcripts of their grades at the Registrar's Office. There is a charge of \$2.00 per copy, payable in advance. Unofficial transcripts are issued free of charge

Scholarships and Financial Aid

Scholarships

The following University College and Lincoln College scholarships and awards are available to students who have been accepted as degree candidates (i.e., who have earned at least 18 quarter hours of credit and have a matriculation certificate) and are in good academic standing.

Scholarships are awarded once a year by the Scholarship Committee. Final selection of scholarship recipients is usually made in late May, followed by the awarding of the scholarships in late June or early July. Funds are usually applied to tuition expenses for the following academic year. Awards range in amount from \$250 to \$700.

Application Procedure In January, a mailing list of students who have requested applications is prepared, and applications are mailed out with the stipulation that they be completed and returned to the Office of the Dean by March 31. A student may be placed on the January mailing list by calling 617-437-2400 and leaving his or her name, address, and student I.D. number with the receptionist.

Professor Joseph A. Mullen Scholarships

The Massachusetts Chapter of the American Society for Training and Development has established a fund to provide annual scholarship awards to deserving part-time students upon the recommendation of the Dean of University College.

Martin Luther King Jr. Scholarships

Established in 1969 in memory of the late Rev. Martin Luther King, Jr. Awards are made, as openings occur, to a limited number of adults from minority groups who would otherwise be unable to continue their education. Stipends can cover tuition expenses not to exceed six quarter hours in any academic quarter (excluding Summer quarter). Northeastern University's Office of Financial Aid, located in 254 Richards Hall, administers these scholarships.

Kappa Tau Phi Scholarships

The Kappa Tau Phi Sorority Scholarship Fund annually makes available scholarship awards. They are granted to women students in the arts and sciences, business, and engineering programs who rank high-

est at the end of the upper-middle year. In the event that the chosen student is eligible for an award of greater monetary value, the award will be made to the next highest-ranking woman student. To be eligible for this scholarship, the student must be enrolled in a program of at least two evenings per week and must be a candidate for the bachelor's degree. In determining the recipient, grades of all courses completed in prior years shall be considered.

Harry Olins Memorial Scholarship The Harry Olins Memorial Scholarship Fund was established as an expression of firm belief in University College students and "what they stand for." The fund, presented by Mrs. Harry Olins in recognition of her husband's long service on the business faculty, makes available an annual tuition award to students who, in terms of scholastic achievement, character, and personal need, best typify the spirit of Northeastern University. To be eligible for this award, the student must be a business administration degree candidate and carry a full academic load during the school year.

William J. McGovern Memorial Scholarship

The William J. McGovern Memorial Scholarship was established in 1978 by an anonymous donor to honor the memory of William J. McGovern. The donor wishes to assist others in realizing their potential through higher education. The income from this scholarship will benefit worthy undergraduate students actively pursuing studies in University College or Lincoln College. Recipients must be in a matriculated status, demonstrate financial need and academic achievement, and must exhibit a high level of professional promise.

Eva Needle Memorial Scholarship

The Eva Needle Memorial Scholarship Fund was established in 1965 with the aid of the Norman Knight Charitable Foundation and is maintained through the generosity of the friends of Bob and Ted Needle in memory of their mother. The income from the Scholarship Fund is awarded annually to a deserving student in the accounting program who demonstrates superior academic achievement. The recipient is selected jointly by Ted Needle, a long-standing member of the University College accounting faculty, and the Scholarship Committee.

H. Patricia Taylor Scholarship Fund The H. Patricia Taylor Scholarship Fund was established in 1974 by H. Patricia Taylor, a graduate of University College, and her husband, Harry C. Taylor, a graduate of the School of Business. The scholarship expresses their appreciation for financial assistance made available to Mrs. Taylor while obtaining her degree and is an attempt to provide similar funds to assist others in realizing their potential through higher education. The income from the scholarship fund will be awarded annually to a student enrolled in University College or Lincoln College who demonstrates financial need and academic stability and who meets certain other conditions of eligibility.

University and Lincoln College Faculty Society Memorial Scholarship Awards The Faculty Society of University and Lincoln Colleges, Northeastern University, offers two awards annually, primarily for excellence in studies, to bachelor's degree candidates in University and Lincoln Colleges who have carried and are currently carrying a minimum of 24 quarter hours annually. Applications, available during the Winter quarter, must be returned before the Spring quarter. These awards are known as University and Lincoln College Faculty Society Club Memorial Scholarship Awards in commemoration of the Club's deceased members.

U.S. Navy Field Training Supervisors Association Memorial Scholarship A scholarship fund has been established through the generosity of the United States Navy Field Training Supervisors Association, in commemoration of the Association's deceased members. The scholarship is awarded annually to a deserving student, selected by the Scholarship Committee, who is a management major working toward a Bachelor of Science degree in the evening program of University College.

Roberta Macycove Wasserman Memorial Scholarship This scholarship was established in 1976 through the generosity of family members and friends of Roberta Macycove Wasserman, who, at the time of her death in 1975, was pursuing arts and sciences studies within University College. The income from the Memorial Scholarship Fund is awarded annually to a deserving female student who is a homemaker with family responsibilities and who is pursuing part-time studies within University College. The recipient shall demonstrate financial need, soundness of character, and academic stability.

Sigma Epsilon Rho Honor Society Scholarship Award The Sigma Epsilon Rho Honor Society Scholarship Award, established in 1974 by the membership of the Society, is awarded annually to an undergraduate student of University or Lincoln College at Northeastern University. Eligible students must have a cumulative quality point average of 3.0 or better after completing 80 percent or more of their required studies.

Transportation Club of New England Scholarship The Transportation Club of New England provides approximately eight scholarships annually for persons employed in transportation and industry traffic departments. The scholarships are applicable toward tuition, books, and incidental expenses involved in transportation management courses. The purpose of the plan is to afford a limited number of people an opportunity to expand and improve their education by systematized study in courses in the field of transportation and distribution management. The scholarships are administered cooperatively with the Scholarship Committee of the Transportation Club of New England. Applications may be secured from and filed with the Secretary, Transportation Club of New England, 150 Causeway Street, Boston, Massachusetts 02114. Each applicant must be sponsored by a member of the Transportation Club.

Electronics Industries Personnel Association Scholarship This Scholarship was established in 1980 through the generosity of the Electronics Industries Personnel Association. The income is awarded annually to one or more students enrolled and matriculated in the Personnel and Industrial Relations program in University College. Recipients shall demonstrate financial need, soundness of character, and academic stability.

Financial Aid

The Office of Financial Aid, located in 254 Richards Hall, offers several types of assistance to part-time students. All awards are based on financial need. Aid granted from programs sponsored by the Federal government is dependent upon the amount of funding allocated to Northeastern University. The University does not award financial assistance in any form to students who are not citizens or permanent residents of the United States.

Satisfactory Academic Progress for Financial Aid Recipients Recipients of financial aid are required to make satisfactory academic progress

in order to continue their eligibility for aid. University College defines "satisfactory academic progress" as

- a minimum course load of six credit hours per quarter
- a minimum average of C, or 2.0, in these courses
- a cumulative academic record in any given academic year (September through June) that reflects that the financial aid recipient has registered for a minimum of 18 quarter hours of credit and satisfactorily completed at least 12 quarter hours of credit with an overall quality point average of 2.0 or better.

If at the end of any given academic year, a student receiving financial aid has failed to make satisfactory academic progress toward his or her degree, the Office of Financial Aid will be notified by University College.

Pell Grant The Pell Grant Program is a Federal aid program designed to provide financial assistance to degree candidates who need it to attend post-high school educational institutions. Pell Grants are intended to be the "floor" of a financial aid package and may be combined with other forms of aid in order to meet the full costs of education. The Pell Grant is an award and, unlike a loan, does not have to be repaid. Half-time students taking at least six credit hours each quarter may now apply for awards ranging up to one-half the maximum allowable by law, contingent upon the total cost of education. Applications are available in the Office of Financial Aid, 254 Richards Hall, or by writing to the Pell Grant Program, Post Office Box 84, Washington, D.C. 20044.

Massachusetts State Scholarship Massachusetts residents enrolled as full-time students (i.e., 12 credit hours per quarter for Fall, Winter, and Spring) may be eligible for a Massachusetts State Scholarship. To apply, students must submit a Massachusetts Financial Aid Form (MFAF) for residents of Massachusetts. The deadline date for applications is March 1. Massachusetts State Scholarships are awarded based on need as determined by the Massachusetts Financial Aid Form.

National Direct Student Loan This program is available to students who are carrying a full-time academic workload, are accepted as degree candidates (i.e., have 18 credit hours and a ma-

trication certificate), and show evidence of financial need.

Students may borrow as much as \$1,500 each academic year, up to the maximum of \$6,000 for their undergraduate education, or a total of \$12,000 through the completion of graduate studies. Repayment and interest on these loans do not begin until six months after the student ceases to carry at least a half-time academic load at an institution of higher education. The repayment of principal may be extended over a ten-year period with the interest at the rate of 5% per annum. Repayment may be deferred up to a total of three years while a borrower is serving as a Peace Corps or VISTA volunteer.

Guaranteed Student Loan Program The Guaranteed Student Loan Program enables a student to borrow a maximum of \$2,500 per academic year directly from a bank, credit union, or other participating lender in the student's home community. The loan is guaranteed by a state or private nonprofit agency and is insured by the federal government. The interest on the loan will be subsidized by the federal government while the student is in school. **The loan must be repaid.**

Students whose families have an adjusted gross income below \$30,000 will be eligible for a loan if they are enrolled or have been accepted for enrollment at least half-time in an institution of higher education and are citizens or nationals of the United States. Students whose families exceed this income ceiling may be eligible if they can show financial need in accordance with U.S. Department of Education guidelines. All students are eligible for federal interest benefits. Under these benefits, the federal government will pay the interest until the student begins repaying the loan.

The legal maximum loan borrowed through the Guaranteed Student Loan Program for any single academic year is \$2,500. The maximum loan for an entire undergraduate program is \$12,500.

The maximum loan amount in one academic year may never exceed the cost of education, less other financial aid received. In practice, however, the Guarantee Agency in the state where the loan is written may set loan limits less than these maximums. In the final analysis, the lender decides the amount of the loan.

Repayment of a Guaranteed Loan usually begins six months after a student withdraws or graduates from an educational institution or ceases to carry at least a half-time course load. The repay-

ment period may be as long as ten years. The amount of the payments depends upon the size of the debt and the student's ability to pay; in most cases, the borrower must pay at least \$600 per year.

During the repayment period, the loan carries a simple interest rate of 9 percent per annum, which is paid by the borrower.

Note: For students who have previously participated in the Guaranteed Student Loan Program and who have outstanding loans at 7%, the interest rate on subsequent loans will continue to be 7%.

Repayment on loans may be deferred if the borrower returns to at least half-time study at an eligible educational institution. Deferment of repayment is also allowed for up to three years of service in the armed forces, Peace Corps, or full-time programs conducted by ACTION. In most cases, the actual repayment schedule will be established by the lender shortly after the borrower leaves school.

Students who borrow funds through the Guaranteed Student Loan Program are subject to certain legal responsibilities that include:

1. Students must report any of the following changes to the lending institution:
 - a. withdrawal from school
 - b. transfer to another school
 - c. reduction of course load to less than half-time
 - d. change of address or parents' address
 - e. change of name.
2. Students are liable for any false information that they report on the application.
3. Students must use the loan funds for educational purposes only.
4. If a student fails to repay the loan as agreed under the federally Insured Loan Program Regulations, legal action can result.

Failure to comply with any of the above responsibilities could make a student ineligible for any future loans from the program.

Additional information about financial aid is available from the Office of Financial Aid, 254 Richards Hall, telephone 617-437-3190.

All Federal financial aid programs are subject to change depending on adequate and continuing federal support.

Student Activities

Student activities for part-time students are planned, organized, and operated by the student body, with the assistance of the Director of University-Lincoln College Student Activities. The programs are designed to keep pace with the changing needs of adult students and to provide maximum opportunity for student participation. All part-time students in University College and Lincoln College are welcome to participate.

The program is flexible in nature and pioneering in spirit to meet the needs of adult students. The Office of University-Lincoln College Student Activities is particularly interested in developing new clubs that will benefit students professionally and educationally. If students wish to start clubs related to their professions, this office will help them plan and organize clubs on the local and national levels. The program is dedicated to assisting the adult student in the development of his or her fullest potential. The University-Lincoln College Student Activities Office is located in 200 Churchill Hall, telephone 617-437-8697.

Purpose

The purposes of part-time student activities are: to provide opportunities for the development and pursuit of cultural interests and professional objectives; to encourage the development of leadership activities and skills; to enable the student to identify more closely with the University; and to include the family as an important and vital motivating force in the part-time student's educational career.

Sigma Epsilon Rho Honor Society

Sigma Epsilon Rho is the honor society of University College. Its purposes are: to promote acquaintance and good fellowship among those students who have attained highest scholastic standing in the College; to stimulate the student body to higher scholastic accomplishment through the bearing, influence, and work of these selected men and women; to develop methods of mutual improvement and advancement among members; and to support high moral, professional, and scholastic ideals.

Only honor graduates or seniors with honor standing at the end of the junior year are eligible

for admission to the society. Admission is by invitation after nomination by the society.

An outstanding book is awarded each year by Sigma Epsilon Rho Society to the highest-ranking student at the conclusion of the junior year. Students will receive the award only in the event that they enroll for the subsequent year.

Lambda Alpha Epsilon

Lambda Alpha Epsilon is a national law enforcement fraternity founded in 1957. The Northeastern Chapter, Kappa Phi Beta, is open to part-time and day students enrolled in law enforcement, security, and correctional practices programs, and to professional men in the fields of law enforcement and security. The fraternity is dedicated to the furtherance of professional standards in law enforcement.

Gymnasium Facilities

Part-time students may utilize the gymnasium facilities during the hours 4:30–9:30 p.m. Monday through Friday, and during all open hours on Saturday, Sunday, and holidays. A valid Northeastern student identification card must be presented to gain access to the facilities.

Specific schedules for use of the pool, universal weight room, indoor track and cage, gymnasium, gymnastics room, and wrestling room are available at the beginning of each quarter in the Intramural Sports Office, Room 111 Cabot.

Alumni Association

More than 86,000 alumni are united within an Alumni Association, created to establish a mutually beneficial relationship between Northeastern and its graduates. The Association is governed by an Executive Committee elected from the alumni community. Membership into the Association is automatic upon graduation.

The Association is headquartered in the Office of Alumni Relations in 310 Churchill Hall. The official records and addresses of alumni are maintained in the Office of Alumni Records, 236 Huntington Avenue.

Activities of the Association include the Homecoming celebration, presentation of the Outstanding Alumni Awards, and the annual presentation of Professional Promise Awards to outstanding

seniors in each of the Colleges. Alumni officers are also involved in establishing diverse enrichment and education programs to meet the contemporary vocational and avocational needs of Northeastern's graduates. The Alumni Association has also initiated a successful group travel program to provide the alumni of Northeastern with interesting, economical opportunities in foreign travel. Notice of all activities is provided in the Northeastern alumni magazine and in special publications.

Regional alumni clubs have been established from coast to coast. All alumni are eligible to become members of these organizations. The clubs meet periodically with a varied program, often in conjunction with professional and athletic events, faculty visits, and service projects. Additionally, alumni class organizations conduct reunions for their respective classes every five years.

The Association sponsors and assists constituent organizations that focus on common professional and avocational interests and college affiliations. These groups have their own officers and conduct various programs throughout the year.

In addition, alumni volunteers in many metropolitan areas across the nation represent the Admissions Office on a continuing basis at high schools and community colleges.

Programs of Study

University College conducts part-time educational programs at the undergraduate level during day and evening hours. The programs are designed to help meet the varying needs and interests of adult students who may enroll as students following degree programs or as nondegree students taking single courses or special programs.

University College programs leading to the Bachelor of Science, Bachelor of Science in Business Administration, and Bachelor of Arts degrees help provide opportunities for cultural and professional development equivalent in quality and scope to those offered in the conventional four-year college enrolling full-time students. The bachelor's degree requires approximately 174 quarter hours of credit.

Programs leading to the Associate in Science degree help provide students with a background in fundamental areas in business administration, arts and sciences, law enforcement, and health professions. The Associate degree requires 96 quarter hours of credit and is equivalent to the conventional two-year, or junior, college in scope and quality.

Degree curricula are offered in the following areas:

Business Administration

Major	Page
Accounting	
Associate in Science	51
Bachelor of Science in Business Administration	63
Business Administration	
Associate in Science	52
Finance	
Associate in Science	53
Hotel and Restaurant Management	
Associate in Science	54
Human Resources Management	
Associate in Science	55
Industrial Management	
Associate in Science	56
Industrial Technology	
Bachelor of Science	62
Management	
Bachelor of Science in Business Administration	64

Management Information Systems	
Associate in Science	57
Bachelor of Science in Business Administration	65
Marketing	
Associate in Science	58
Purchasing	
Associate in Science	59
Real Estate	
Associate in Science	60
Transportation and Physical Distribution Management	
Associate in Science	61

Arts and Sciences

Major	Page
Arts and Sciences	
Associate in Science	79
Economics	
Bachelor of Arts	70
Bachelor of Science	71
English	
Bachelor of Arts	72
Bachelor of Science	73
Technical Communications	
Bachelor of Science	74
Fine Arts	
Bachelor of Arts	76
Bachelor of Science	76
History	
Bachelor of Arts	77
Bachelor of Science	77
Political Science	
Bachelor of Arts	80
Bachelor of Science	81
Psychology	
Bachelor of Arts	83
Bachelor of Science	84
Sociology-Anthropology	
Bachelor of Arts	85
Bachelor of Science	85
Music	
Bachelor of Arts	88
Bachelor of Science	88
Chemical-Biological Technology	
Associate in Science	89
Bachelor of Science	90

Law Enforcement

Major	Page
Correctional Practices	
Bachelor of Science	96
Associate in Science	98
Law Enforcement	
Bachelor of Science	100
Associate in Science	102
Security	
Bachelor of Science	104
Associate in Science	106

Health Professions Programs

Major	Page
Health Science	
Bachelor of Science	110
Health Management	
Bachelor of Science	113
Option in Long Term Care	
Administration	114
Option in Community Health	
Management	114
Health/Medical Record Administration	
Bachelor of Science	116
Certificate	117
Medical Laboratory Science	
Associate in Science	119
Medical Technology	
Bachelor of Science	120
Hematology	
Bachelor of Science	121
Cytotechnology	
Certificate	123
Radiologic Technology	
Associate in Science	124
Therapeutic Recreation Services	
Certificate	127
Associate in Science	128

Course descriptions are listed in numerical order by department beginning on page 141.

Business Administration

Dorothy M. Oppenheim, Assistant Dean
Director, Business Administration Programs
Telephone 437-2418

Purpose

University College recognizes that adult students seek educational opportunities in business to satisfy many different professional needs. To help meet these needs, University College offers a wide selection of business and business-related courses, as well as structured academic programs. Among the available options are eight certificate programs, eleven associate degree programs, and four baccalaureate degree programs. All certificate and degree programs share the common objective of offering students an opportunity to achieve professional competence in a formal set of business subjects, while laying the foundation for further professional growth.

The Programs

Certificates in Business University College offers eight different certificate programs for individuals seeking to build or advance a marketable specialization in business. The professional areas covered by the certificate programs include: Accounting, Computer Systems and Programming, Finance, Hotel and Restaurant Management, Human Resources, Marketing, Purchasing, and Transportation and Physical Distribution Management.

The University College Certificate Programs in Business are designed for:

- students who plan to complete an associate degree and possibly a bachelor's degree but who first want to acquire the marketable skills offered in the certificate program
- individuals seeking an intensive course of study in a business discipline but not wishing to acquire a degree
- individuals already holding a degree who wish to acquire specialized knowledge for career change or professional development.

All certificate programs are designed so that transfer into a related degree program is possible. Certificates can be earned based on academic work completed within the last five years. Detailed information on these certificate pro-

grams, together with a recommended course sequence for completing them, appears in the section on certificate programs, pages 131 to 137.

Associate in Science Degree Northeastern offers part-time students a choice of eleven business programs leading to the Associate in Science degree: Accounting, Business Administration, Finance, Hotel and Restaurant Management, Human Resources Management, Industrial Management, Management Information Systems, Marketing, Purchasing, Real Estate, and Transportation and Physical Distribution Management.

These programs provide breadth of perspective through exposure to a well-balanced sequence of arts and sciences courses. Specialized knowledge for future managerial growth may be acquired through the study of a core of professional business courses and a major or concentration in a business discipline. Students who have completed a certificate program may enroll in an associate degree program. While the credits earned in a certificate program may be applied toward this degree, completion of a certificate program is not required for the associate degree. To be awarded the associate degree, a student must successfully complete the 96 quarter hours of course credit detailed on the following pages.

Associate in Science Degree (old curriculum) Students who are pursuing one of the six associate degree programs offered by University College prior to the 1983–84 academic year will find that some of the course requirements for these degree programs have been changed as of September 1983. In those instances where courses are no longer offered, appropriate course substitutions will be granted. (Please refer to the 1982–83 University College Bulletin, pages 48 to 53.) Students desiring to complete an A.S. degree under the requirements in effect as of September 1983, or wishing to transfer into one of the five new A.S. degree programs being offered as of September 1983, should contact the Office of Academic and Student Affairs.

Bachelor of Science in Business Administration Degree (new curriculum) The Bachelor of Science in Business Administration degree is offered in Accounting, Management, and Manage-

ment Information Systems. Students who have clearly decided to pursue a baccalaureate degree in business should enroll in the courses detailed on page 50 prior to petitioning for admission to the Bachelor of Science in Business Administration degree program. These courses will provide students with the broad educational foundation needed for the study of professional-level courses in business administration.

Students who wish to earn one of the Associate in Business degrees in business prior to entry into the Bachelor of Science in Business Administration degree program are advised that the University College Bachelor of Science in Business Administration degree program includes a validation requirement for upper-level business courses taken while pursuing the associate degree. (See details below.)

Admission to the Bachelor of Science in Business Administration degree program is restricted to students who have maintained a 2.0 cumulative grade-point average and completed a minimum of 80 quarter hours (60 semester hours) of credit, including certain basic courses in required subjects, either in University College or at another accredited institution. There is a special application form for admission to the Bachelor of Science in Business Administration program. It should be noted that students do not need to receive the associate degree in order to matriculate into the baccalaureate program.

The Bachelor of Science in Business Administration degree program conforms with all standards established by the American Assembly of Collegiate Schools of Business (AACSB), which has been recognized by the Council for Postsecondary Accreditation and by the United States Office of Education as the sole accrediting organization for university bachelor's and master's degree programs in business administration. While there are more than 2,000 college and university business programs in the United States, fewer than 10 percent of these institutions offer business programs that are fully accredited by AACSB. Northeastern University is unique in the New England region in that both its full-time and part-time baccalaureate degree business programs are accredited.

Validation Requirement

"Validation" is the term used to describe a set of procedures that tests whether an upper-level course completed at the lower division of a baccalaureate program should be accepted for

transfer credit in the upper division of an AACSB-approved baccalaureate degree program.

There are three approved validation methods.

1. *Sequential Course.* Students who enroll in the new Bachelor of Science in Business Administration degree program can validate a course taken at University College or elsewhere by successfully completing a course that is sequential to the course already completed. For example, successful completion of Financial Management 1 can validate Principles of Finance or a comparable introductory course in finance, regardless of where the student completed the course. Similarly, by successfully completing Marketing Management, a student can validate Introduction to Marketing 1.

2. *College Level Examination Program (CLEP) and/or Proficiency Examination Program (PEP).* These standardized examinations can be used to validate some previously taken upper-level business courses.

3. *Departmental Examination.* In cases where a sequential course does not exist or is not desired by a student, and no appropriate CLEP or PEP examination exists, validation can be accomplished through a departmental examination.

Please note that certain courses do not require validation. They include the following: Accounting Principles 1, 2, and 3; Introduction to Business and Management 1, 2, and 3 (formerly Management and Organization 1 and 2, and Principles and Practices of Management); Introduction to Data Processing and Information Systems 1 and 2 (formerly Electronic Data Processing 1 and 2), Law 1 and 2; and all computer programming language courses. Also, business-related courses in other disciplines do not have to be validated. Examples are courses in economics and statistics.

In addition, previously taken upper-level business courses that are not required for a particular business concentration are considered to be electives and do not need validating. For example, an upper-level course in cost accounting would not require validation for management concentrators, since cost accounting is not a required course for management concentrators in the Bachelor of Science in Business Administration degree programs.

Planning a Program of Study

Current Students Currently enrolled students, including those who have already been awarded

transfer credit by the Office of Academic and Student Affairs, may have their credits reevaluated toward one of the new Bachelor of Science in Business Administration degree programs by completing a General Petition, which will enable students to review their degree program options and select the program that best suits their needs. The General Petition may be requested by calling 617-437-2400. Petitions are also available at all campus locations. After receiving an evaluation of their transfer credits, students may schedule an appointment with an academic adviser to discuss the alternative academic programs available to them.

New Students Students who plan to enter University College to work toward the Bachelor of Science in Business Administration degree should submit to the Office of Academic and Student Affairs transcripts of previously completed college-level coursework and a Petition for Transfer Credit. (Transfer credit petitions may be requested by calling 617-437-2400. They are also available at all campus locations.) Students will receive by mail a transfer credit evaluation and a suggested plan of study to prepare for admission to the Bachelor of Science in Business Administration degree program. When this paperwork has been completed, students are encouraged to schedule an appointment with an academic adviser to discuss their programs.

Students who do not have any academic courses that may be transferred from another educational institution or program should plan to meet with an academic adviser early in their studies in University College. These students will be required to complete 80 quarter hours of credit,

including English 1, 2, and 3; Mathematics 1, 2, and 3; and a social science elective from the group of courses listed at the end of the next section. The course work must be completed prior to admission to the Bachelor of Science in Business Administration degree program.

Admissions Requirements A Petition for Admission to the Bachelor of Science in Business Administration degree program must be completed and returned to the Office of Academic and Student Affairs to initiate the admissions process. This petition may be obtained at all campus locations or by calling 617-437-2400.

To be admitted to the Bachelor of Science in Business Administration degree program, students must have completed at least 80 quarter hours of credit with an overall grade point average of C (2.0) or better. This course work must include English 1, 2, and 3; Mathematics 1, 2, and 3; and one social science elective or its equivalent. Students are encouraged to earn their remaining credits by selecting courses from the recommended lower-level course listing that follows.

Students who have not completed Mathematics 1, 2, and 3, but have fulfilled all other requirements for admission to the Bachelor of Science in Business Administration degree program will be given "conditional admission" to the program, pending completion of Mathematics 1, 2, and 3 within three academic quarters after admission is granted. Conditional admission permits a student to register for upper-level required business courses while simultaneously completing Mathematics 1, 2, and 3.

Recommended Lower-Level Courses

				quarter hours
Arts and Sciences Courses				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues (formerly Psychology 1)	3
19.302			Introduction to Psychology: Developmental Aspects (formerly Psychology 2)	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics (formerly Psychology 3)	3
21.301			Introduction to Sociology: Fundamental Issues (formerly Sociology 1)	3
21.302			Introduction to Sociology: The Individual and Social Roles (formerly Sociology 2)	3
or			or	
21.303			Introduction to Sociology: Critical Issues Facing Society (formerly Sociology 3)	3
30.305	30.306	30.307	English 1, 2, 3	9
30.311	30.312		Business Writing and Reports 1, 2	6
37.301			Effective Communication 1	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2 (formerly Electronic Data Processing 1 and 2)	6
Business Administration Courses				
41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
45.301	45.302	45.303	Introduction to Business and Management 1, 2, and 3 (formerly Management and Organization 1 and 2, and Principles and Practices of Management)	9
49.301	49.302		Law 1, 2	6
Nonbusiness Electives				6
Elective in Natural Sciences				3

Bachelor of Science Degree (to be phased out as of June 1986) Students who have accumulated 88 or more quarter hours of credit by September 1983 may continue to work toward a bachelor's degree under the course and program requirements in effect up until the Fall quarter of 1983. However, students continuing in these programs must complete the degree by June 1986, since these programs will no longer be available after that date. Students pursuing Bachelor of Science degree programs that will be discontinued in June 1986 should consult the 1982-83 University College Bulletin for details on degree requirements.

Business Minor Students enrolled in Bachelor of Science degree programs outside the area of

business may choose to minor in business. A minor in business may be attractive to individuals seeking to enhance their professional credentials without necessarily obtaining a business degree. Individuals who earn an associate degree in a business program and transfer to a bachelor's degree program other than business have the option of earning a minor in business administration. Students earning a bachelor's degree in a nonbusiness area are permitted to accumulate up to 44 quarter hours (25 percent of the credits toward a bachelor's degree) in business subjects. Any credits accumulated beyond this limit from business courses cannot be used to fulfill the graduation requirements for a B.S. degree in a nonbusiness area.

Accounting (Major Code 470)**Associate in Science Degree****Core Courses—Arts and Sciences****quarter hours**

10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
45.400			Production Management	3
49.301	49.302		Law 1, 2	6
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3

Choose one computer programming course from:

49.320			Introduction to Programming in COBOL	3
49.335			Introduction to Programming in BASIC	3
49.327			FORTTRAN Programming 1	3

Major Concentration Courses

41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
41.401	41.402	41.403	Intermediate Accounting 1, 2, 3	9
41.405			Cost Accounting 1	3

Nonbusiness Electives

				3
--	--	--	--	---

Total Credits**96**

Business Administration (Major Code 401)				Associate in Science Degree	
				quarter hours	
Core Courses—Arts and Sciences					
10.627	10.628	10.629	Mathematics 1, 2, 3		9
19.301			Introduction to Psychology: Fundamental Issues		3
19.302			Introduction to Psychology: Developmental Aspects		3
or			or		
19.303			Introduction to Psychology: Personal Dynamics		3
30.305	30.306	30.307	English 1, 2, 3		9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3		9
39.311	39.312		Statistics 1, 2		6
Core Courses—Business Administration					
41.301	41.302	41.303	Accounting Principles 1, 2, 3		9
43.301			Introduction to Marketing 1		3
44.301			Principles of Finance		3
45.301			Introduction to Business and Management 1, 2, 3		9
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2		6
49.440			Organizational Behavior		3
49.441			Introduction to Human Resource Management		3
49.442			Applied Human Resource Management		3
Nonbusiness Electives					6
Open Electives					12
Total Credits					96

Recommended course sequence for the three-year program leading to the Associate in Science Degree in Business Administration. (It is recommended that students in the other Associate in Science degree programs follow a similar sequence.)

	Quarter 1	Quarter 2	Quarter 3
First Year	English 1 Accounting 1 Organizational Behavior Introduction to Business 1	English 2 Accounting 2 Introduction to Human Resource Management Introduction to Business 2	English 3 Accounting 3 Applied Human Resource Management Introduction to Business 3
Second Year	Economics 1 Math 1 Introduction to Data Processing and Business Systems 1 Elective	Economics 2 Math 2 Introduction to Data Processing and Business Systems 2 Elective	Economics 3 Math 3 Elective Elective
Third Year	Psychology Statistics 1 Elective	Psychology Statistics 2 Elective	Principles of Finance Introduction to Marketing Elective

Finance (Major Code 476)**Associate in Science Degree****quarter hours****Core Courses—Arts and Sciences**

10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
43.301			Introduction to Marketing 1	3
45.301			Introduction to Business and Management 1	3
49.301	49.302		Law 1, 2	6
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3

Choose one computer programming course from:

49.320			Introduction to Programming in COBOL	3
49.335			Introduction to Programming in BASIC	3
49.327			FORTTRAN Programming 1	3

Major Concentration Courses

44.301			Principles of Finance	3
44.310	44.311		Financial Management 1, 2	6
44.312			Investment Principles	3
44.314			Credit Principles	3
44.316			Budgeting and Planning	3

Nonbusiness Electives

3

Total Credits**96**

Hotel and Restaurant Management (Major Code 472)				Associate in Science Degree
				quarter hours
Core Courses—Arts and Sciences				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
Core Courses—Business Administration				
41.301	41.302		Accounting Principles 1, 2	6
45.301			Introduction to Business and Management 1	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3
Major Concentration Courses				
47.400			Introduction to Hotel and Restaurant Management	3
47.406			Front Office Management	3
47.407			Hotel and Restaurant Law	3
47.410	47.411		Food Preparation 1, 2	6
47.412			Food Service Engineering and Sanitation	3
47.417			Food and Beverage Cost Control	3
47.423			Managerial Accounting for Hospitality Industry 1	3
Nonbusiness Electives				6
Open Electives				3
Total Credits				96

Human Resources Management (Major Code 477)**Associate in Science Degree****quarter hours****Core Courses—Arts and Sciences**

10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

41.301	41.302		Accounting Principles 1, 2	6
43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
45.400			Production Management	3
49.301			Law 1	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6

Choose one computer programming course from:

49.320			Introduction to Programming in COBOL	3
49.335			Introduction to Programming in BASIC	3
49.327			FORTRAN Programming 1	3

Major Concentration Courses

49.404	49.405		Personnel Management 1, 2	6
49.432	49.433		Employment Rights 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3
49.340			Private Sector Collective Bargaining	3
or			or	
49.429			Public Sector Collective Bargaining	3

Nonbusiness Electives

3

Total Credits**96**

Industrial Management (Major Code 478)				Associate in Science Degree
				quarter hours
Core Courses—Arts and Sciences				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
10.640	10.641		Calculus for Nonengineers 1, 2	6
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
Core Courses—Business Administration				
41.301	41.302		Accounting Principles 1, 2	6
43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
45.400			Production Management	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
Choose one computer programming course from:				
49.320			Introduction to Programming in COBOL	3
49.335			Introduction to Programming in BASIC	3
49.327			FORTTRAN Programming 1	3
Major Concentration Courses				
45.403			Manufacturing Processes	3
45.406			Methods Analysis, Motion and Time Study	3
45.407			Operations Management	3
45.409			Cases in Industrial Management	3
45.411			Industrial Decision Making 1	3
45.414			Materials Management	3
45.419			Managing for Results	3
Open Electives				3
Total Credits				96

Management Information Systems (Major Code 475)				Associate in Science Degree
				quarter hours
Core Courses—Arts and Sciences				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3	9
37.301			Effective Communication 1	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
Core Courses—Business Administration				
41.301	41.302		Accounting Principles 1, 2	6
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
45.400			Production Management	3
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3
Major Concentration Courses				
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.321	49.322	49.323	COBOL Programming 1, 2, 3	9
49.360	49.361	49.362	Systems Analysis and Design 1, 2, 3	9
49.364			Data Systems Administration	3
Nonbusiness Electives				3
Open Electives				6
Total Credits				96

Marketing (Major Code 479)**Associate in Science Degree****quarter hours****Core Courses—Arts and Sciences**

10.627	10.628	10.629	Mathematics 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3	9
30.311			Business Writing and Reports 1	3
37.301			Effective Communication 1	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3

Major Concentration Courses

43.301	43.302		Introduction to Marketing 1, 2	6
43.310	43.311		Advertising and Sales Promotion Management 1, 2	6
43.322	43.323		Sales Management 1, 2	6
43.334	43.335		Marketing Management 1, 2	6

Nonbusiness Electives**6****Total Credits****96**

Purchasing (Major Code 432)**Associate in Science Degree****quarter hours****Core Courses—Arts and Sciences**

10.627	10.628	10.629	Mathematics 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
43.301			Introduction to Marketing 1	3
45.301			Introduction to Business and Management 1	3
45.400			Production Management	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3

Major Concentration Courses

45.410			Production Control and Inventory Management	3
45.414			Materials Management	3
45.451	45.452		Purchasing 1, 2	6
45.457			Art and Technique of Negotiation in Business	3
45.458			Materials Requirement Planning	3
45.459			Subcontract Management	3

Nonbusiness Electives

12

Total Credits**96**

Real Estate (Major Code 471)				Associate in Science Degree
				quarter hours
Core Courses—Arts and Sciences				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
Core Courses—Business Administration				
41.301	41.302		Accounting Principles 1, 2	6
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
Major Concentration Courses				
47.320	47.321		Real Estate Fundamentals 1, 2	6
47.323	47.324		Real Estate Appraisal 1, 2	6
47.328	47.329		Real Estate Financial Analysis 1, 2	6
47.331	47.332		Real Estate Law 1, 2	6
			Department Offerings	3
Nonbusiness Electives				18
Total Credits				96

Transportation and Physical Distribution Management
(Major Code 483)
Associate in
Science Degree
quarter hours
Core Courses—Arts and Sciences

10.627	10.628	10.629	Mathematics 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

41.301	41.302		Accounting Principles 1, 2	6
43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
45.301			Introduction to Business and Management 1	3
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3

Major Concentration Courses

48.301			Elements of Transportation	3
48.302			Physical Distribution Management	3
48.305			Traffic Management 1	3
48.307			Contemporary Issues in Transportation and Distribution	3
48.316			Carrier Management	3
48.321			Transportation Regulation 1	3

Nonbusiness Electives 18

Open Electives 3

Total Credits 96

Industrial Technology (Major Code 490)**Bachelor of Science Degree****quarter hours****Engineering or Science Technology Courses**

96

(Must have completed English 1, 2, 3 or equivalent)

Core Courses—Arts and Sciences

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9

Core Courses—Business Administration

41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
43.301			Introduction to Marketing 1	3
45.301			Introduction to Business and Management 1	3
45.306			Project Planning and Control	3
49.301	49.302		Law 1, 2	6
49.310			Introduction to Data Processing and Information Systems 1	3
49.400			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3

Students are required to select three of the following courses for a total of 9 q.h.

45.407		Operations Management	3
45.409		Cases in Industrial Management	3
45.419		Managing for Results	3
45.386		Industrial Experimentation	3
49.388		Principles of Quality Assurance	3

Nonbusiness Electives

12

Total Credits**174**

Accounting (Major Code 460)			Bachelor of Science in Business Administration Degree	
			quarter hours	
Core Courses—Arts and Sciences				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
or			or	
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9
30.311	30.312		Business Writing and Reports 1, 2	6
37.301			Effective Communication 1	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
Core Courses—Business Administration				
41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
44.310			Financial Management 1	3
45.301			Introduction to Business and Management 1	3
45.310	45.311		Business Policy 1, 2	6
45.330			International Business Management and Operations	3
45.400			Production Management	3
49.301	49.302		Law 1, 2	6
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
Choose one computer programming course from:				
49.320			Introduction to Programming in COBOL	3
49.335			Introduction to Programming in BASIC	3
49.327			FORTTRAN Programming 1	3
Major Concentration Courses				
41.401	41.402	41.403	Intermediate Accounting 1, 2, 3	9
41.407			Intermediate Accounting 4	3
41.405	41.406		Cost Accounting 1, 2	6
41.415	41.416		Federal Income Taxes 1, 2	6
41.412			Auditing 1	3
or			or	
41.417			Internal Auditing 1	3
Nonbusiness Electives				6
Open Electives				30
Elective in Natural Sciences				3
Total Credits				174

Bachelor of Science in Business Administration Degree

Management (Major Code 463)

quarter hours

Core Courses—Arts and Sciences

10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
or			or	
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9
30.311	30.312		Business Writing and Reports 1, 2	6
37.301			Effective Communication 1	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6

Core Courses—Business Administration

41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
44.310			Financial Management 1	3
45.400			Production Management	3
49.301	49.302		Law 1, 2	6
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3

Choose one computer programming course from:

49.320	Introduction to Programming in COBOL	3
49.335	Introduction to Programming in BASIC	3
49.327	FORTTRAN Programming 1	3

Major Concentration Courses

43.334			Marketing Management 1	3
45.301	45.302	45.303	Introduction to Business and Management 1, 2, 3	9
45.306			Project Planning and Control	3
45.310	45.311		Business Policy 1, 2	6
45.313	45.314		Management Seminar 1, 2	6
45.327			Manager and Society	3
45.330			International Business Management and Operations	3

Nonbusiness Electives

6

Open Electives

33

Elective in Natural Sciences

3

Total Credits

174

Bachelor of Science in Business Administration Degree

Management Information Systems (Major Code 465)

				quarter hours
Core Courses—Arts and Sciences				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
or			or	
19.303			Introduction to Psychology: Personal Dynamics	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
or			or	
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9
30.311	30.312		Business Writing and Reports 1, 2	6
37.301			Effective Communication 1	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9
39.311	39.312		Statistics 1, 2	6
Core Courses—Business Administration				
41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
43.301			Introduction to Marketing 1	3
44.301			Principles of Finance	3
44.310			Financial Management 1	3
45.301			Introduction to Business and Management 1	3
45.310	45.311		Business Policy 1, 2	6
45.330			International Business Management and Operations	3
45.400			Production Management	3
49.301	49.302		Law 1, 2	6
49.440			Organizational Behavior	3
49.441			Introduction to Human Resource Management	3
49.442			Applied Human Resource Management	3
Major Concentration Courses				
45.306			Project Planning and Control	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.321	49.322	49.323	COBOL Programming 1, 2, 3	9
49.360	49.361	49.362	Systems Analysis and Design 1, 2, 3	9
49.363			Systems Analysis and Design 4	3
49.364			Data Systems Administration	3
49.365			Data Processing Applications 1	3
49.380			Introduction to Operations Research	3
Open Electives				30
Elective in Natural Sciences				3
Total Credits				174



Arts and Sciences

Director, Science and Health Professions Programs
Telephone 437-2819, Room 244 Forsyth

Marilyn Wiener, Associate Dean
Director, Humanities and Social Science Programs
Telephone 437-2423, Room 204 Churchill

Aims

In providing the means to a modern liberal education, University College has the main objective of stimulating and guiding the self-development of the student in three main areas: first, intellectual growth; second, the development of a sense of values; and third, preparation for, or advancement in, a career.

Intellectual growth—the development of the ability to think independently and creatively—rests upon the foundation of a sound general education. Through the arts and sciences curricula, students are guided toward an appreciative understanding of the active discovery of ideas and methods in the areas of humanities, natural science, and social science. With this training, the student can more fully realize the basic values upon which civilization rests and can more fully participate in the intellectual, moral, and material achievement of that civilization.

Through its many programs, University College tries to provide experiences conducive to the development of personal competence and the ability to work effectively with others, which in turn foster the growth of self-esteem.

University College holds that there is no inconsistency between a truly liberal education and preparation for a vocation. As an adventure in intellectual discovery, a liberal education leads to the broadening and intensification of interests as the student becomes aware of his or her own mental strengths and weaknesses. This discovery is essential for making more intelligent and realistic appraisals of self and career. A career brings meaning and focus to the educational experience. Education presents both a challenge to accept responsibility and an opportunity to seek knowledge and skills.

Bachelor's Degrees in Ten Programs

Students have an opportunity to matriculate for a Bachelor of Arts or Bachelor of Science degree in one of ten programs. Both degrees are offered in Economics, English, Art, Political Science, History, Psychology, Sociology-Anthropology, and Music. In addition, the Bachelor of Science degree is offered in Chemical-Biological Technology and Technical Communications.

One of the distinguishing characteristics of the B.A. degree is that it includes a language requirement, whereas the B.S. degree does not. All degree programs make English 1, 2, and 3 a requisite for matriculation.

For specific distribution requirements, students are advised to consult the program or programs in which they may be interested. (All Arts and Sciences programs appear in this section.)

New Certificates in Six Areas

Students who seek specialized skills to advance their careers may now choose from among the following six humanities certificate programs, which may be taken independently or in conjunction with degree study:

- Advertising and Public Relations
- American Sign Language (ASL)
- Graphic Design and Communication
- Professional Writing
- Software Technical Writing
- Speech Communication

Except for ASL, which is comprised of eight 4-quarter-hour courses, all of which must be taken in residence, each certificate program includes nine 3-quarter-hour courses, and permits limited transfer credit. *For information about all University College certificate programs, as well as course listings for each of the above, see pages 131–137.*

Business Administration Minor

Students who matriculate for either the Bachelor of Arts or Bachelor of Science degree in an arts and sciences program area have the option of completing a minor in business administration. Students wishing to earn a minor in business administration must utilize some of the open elec-

tives permitted in their degree programs for this purpose. Students should meet with an academic adviser from the Office of Academic and Student Affairs to identify the courses required for a minor in business. Students earning a bachelor's degree in an arts and sciences area are permitted to accumulate up to 44 quarter hours (25 percent of the credits toward a bachelor's degree) in business subjects. Any credits accumulated beyond this limit from business courses cannot be used to fulfill the graduation requirements for a B.S. degree in an arts and sciences area.

Enrichment and Skills Offerings

While the Arts and Sciences have long been perceived as disciplines rich in intellectual and cultural content (such as courses in Shakespeare, Western Civilization, Beethoven, and Irish History), their relevance to current career needs are often overlooked. Students are encouraged to explore the practical side of Liberal Arts, which includes courses in social welfare, economics, logic, business writing, and effective speaking.

Applied Concentrations

The option of taking an applied concentration in writing or musical performance is being offered to students who major in English or Music, respectively. Consult the individual programs for details.

Writing Elective Concentration	page 72
Musical Performance Concentration	page 88

Technology Programs

University College offers the following programs, which respond to the current need for technicians and technologists:

Chemical-Biological Technology (A.S.)	page 89
Chemical-Biological Technology (B.S.)	page 90
Technical Communications (B.S.)	page 74

The Associate in Science Degree

The program leading to the associate degree is offered for those desiring a general cultural background in arts and sciences and humanities, but who do not wish to pursue a major field of concentration for the baccalaureate degree.

Candidates for the Associate in Science degree in Arts and Sciences must complete a minimum of 96 quarter hours of credit. This is approximately one half of the requirements (174 quarter hours) for the Bachelor of Science degree.

To provide a balanced program that will achieve the established objectives, the faculty has set a minimum credit requirement in the several areas of study as listed under each major.

Distribution Requirements

For the purpose of satisfying the distribution requirements as specified under the individual Arts and Sciences majors, select from the following:

Math-Science includes only courses in mathematics (10. . . .), physics (11. . . .), chemistry (12. . . .), earth science (16. . . .), biology (18. . . .), and psychology (lab. courses only) (19. . . .).

Humanities includes only courses in philosophy (26. . . .), art (27. . . .), music (28. . . .), theatre arts (29. . . .), English (except *required*) (30. . . .), technical communications (30. . . .), modern languages (except *required*) (31. . . . to 35. . . .), American Sign Language (36. . . .), speech communications (37. . . .), journalism (38. . . .), and library systems (40. . . .).

Social Sciences includes only courses in economics (39. . . .), history (23. . . .), political science (22. . . .), psychology (except laboratory courses) (19. . . .), social welfare (25. . . .), and sociology-anthropology (20. . . . and 21. . . .).

English Requirement The 9 quarter hours of *required* English (30.305, 30.306, 30.307, English 1, 2, 3) must be taken prior to matriculation. These are required courses that cannot be used to satisfy distribution requirements in any arts and sciences course of study.

Honors Program

An upperclass honors program is provided in University College to enable superior students to develop their potential to the highest degree by making it possible for them to pursue studies in their major fields to greater depth than is possible in the regular courses.

The nature of the program is determined by the academic department concerned. Programs may involve any of the following elements: special research projects culminating in honor theses, seminars, reading projects, directed independent study, or creative work. Flexibility is the keynote, with every consideration given to the individual needs and requirements of the student. Honors advisers are chosen from the faculty of the department concerned in consultation with the department consultant.

Students who have earned 96 quarter hours of credit toward their bachelor's degree and who

have a grade point average of 3.0 or better are eligible to apply to the appropriate Program Director of Arts and Sciences in University College for admission to the program. Acceptance as an honors candidate rests with the academic department concerned.

Acceptance of University College Credits by Northeastern's Basic College of Arts and Sciences

The College of Arts and Sciences, one of the basic (day) colleges of Northeastern University, permits its students to enroll for credit in courses in University College when they are pertinent to the student's program and have been approved by the Dean of the College of Arts and Sciences. The credits for such courses may be applied to the total number of credits needed for graduation, to satisfy distribution requirements, and/or to fulfill language and major deficiencies.

Credits from University College, as well as those from other accredited institutions, may not be applied to the quality point average of students in the College of Arts and Sciences except when such credits are from courses taken as substitutes for those College of Arts and Sciences courses failed by students. In such instances, students must receive a grade of C or better in the University College courses and then only 2.0 quality points are applied to the student's record for each course. Courses taken in University College that are not offered in the College of Arts and Sciences may be transferred with the full grade upon approval of the major department as well as the Dean of the College of Arts and Sciences.

Credit for Noncollegiate Experience (NCE)

A matriculated Arts and Sciences student with a departmental major in University College is eligible to obtain noncollegiate experience credit (NCE) for knowledge acquired in a nontraditional manner.

Whenever possible, NCE should be used as a substitute for specific Arts and Sciences courses (for example, substituting NCE in Public Speaking for 37.301). When a specific course is deemed critical to the academic soundness of the major, a student may be asked to take the course but may, in addition, receive NCE credit in the subject area in which he or she has acquired special knowledge.

A maximum of nine quarter hours of NCE credit is allowed in applied and vocational areas (e.g., photography and technical writing), while up to

sixteen quarter hours of NCE credit is allowed in other academic areas (e.g., sociology, philosophy, and economics).

To apply for NCE credit, a student must file a petition listing the relevant courses, reasons for which credit should be received, and if appropriate, attaching any materials that might serve as documentation.

Notification of acceptance or rejection of the petition will be issued by the Office of Academic and Student Affairs, as directed by the appropriate Arts and Sciences Program Director, with the advice of the concerned departmental consultant(s). The latter will determine whether the petitioner's NCE is equivalent to the course listings as claimed. Criteria for such evaluation may or may not include a formal examination, an interview, departmental consultation, or a request for additional documentation.

If positive action is taken on the petition, the resulting NCE credits may be applied toward a Bachelor's degree. However, students should be aware of certain constraints. To have NCE credit counted to qualify for a given June graduation, the petition must be filed at least six months prior to the commencement date. NCE cannot be used to fulfill residence requirements. NCE credit cannot be given for courses that can be accredited through the CLEP testing program at the time of the petition. Grades will not be assigned to NCE credits. It is possible that NCE credit may be applicable toward a degree in University College only.

Field Work Courses

To provide the opportunity for students to apply their academic background to practical problems, several departments have introduced courses in their curricula entitled "Field Work In. . . ."

A field work course shall have the following characteristics (as voted by the Curriculum Committee):

1. It shall be a one-quarter course worth six quarter hours of credit.
2. Only matriculated majors within the department offering the course may register.
3. The prerequisites shall be established by the department.
4. Each student shall make his or her own arrangements for carrying on suitable field work at a departmentally acceptable organization involving departmentally acceptable field work experience(s). The department will participate in student placement only in an advisory capacity.

- 5. Each student shall spend a minimum of fifteen hours per week at the outside organization on a volunteer or paid basis.
- 6. Each student shall meet with the departmental field work adviser as frequently as the adviser feels necessary, but in any case no fewer than three times per quarter (once to formulate the program of field work experience, once to discuss ongoing work, and once to transmit and discuss the final written report).
- 7. The student's grade shall be dependent upon both the quality of the experience as demonstrated in the final report and the discussions between the U.C. field work adviser and the outside supervisor.
- 8. Provided that one student registers, the course will not be cancelled.
- 9. The outside supervisor will be offered a transferrable voucher for a tuition-free course at Northeastern University.

Prior to registration, each student should consult with the major department.
All field work courses will be numbered as follows:—,499.

Directed Study

Students may be eligible to enroll in a maximum of two Directed Study courses in the following majors: Art, English, Music, Psychology, Sociology, Anthropology, History, Political Science, and Economics. The Directed Study is intended primarily for the matriculated senior who is unable to take a course needed for graduation because of circumstances beyond his or her control (e.g., the course was not reasonably available during the student's tenure in University College). Such students should contact the program office for a petition to establish advanced student status. Please refer to course descriptions for more detailed information.

Economics (Major Code 390)

Bachelor of Arts Degree

quarter hours

Distribution Requirements

See page 68 for courses included in these categories:			
Math-Science			18
Humanities			24

Social Science Requirements

Eighteen quarter hours from among the following social science disciplines: psychology, sociology/anthropology, history, political science.			18
---	--	--	----

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
Modern Language			Elementary or Conversational	12
			Intermediate	12

Major Concentration Courses—Required

39.301	39.302	30.303	Economic Principles 1, 2, 3	9
39.311			Statistics 1	3
39.312			Statistics 2	3
39.313			Forecasting and Other Topics in Statistics	3
39.317	39.318		Money and Banking 1, 2	6
39.319			Government Finance	3
39.327			Labor Economics	3

Major Concentration Electives from advanced-level courses: (39.---series)			27
--	--	--	----

*Electives			24
-------------------	--	--	----

Total Credits			174
----------------------	--	--	-----

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to p. 182.

Economics (Major Code 390)**Bachelor of Science Degree****quarter hours****Distribution Requirements**

See page 68 for courses included in the category below:

Social Sciences (other than Economics courses). 18

Arts and Sciences Program Requirements

30.305 30.306 30.307 English 1, 2, 3 (required prior to matriculation) 9

Major Concentration Courses—Required

39.301 39.302 39.303 Economic Principles 1, 2, 3 9

39.311 Statistics 1 3

39.312 Statistics 2 3

39.313 Forecasting and Other Topics in Statistics 3

39.317 39.318 Money and Banking 1, 2 6

39.319 Government Finance 3

39.327 Labor Economics 3

Major Concentration Electives from advanced-level courses: (39.---series) 48***Electives 69****Total Credits 174**

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to p. 182.

English (Major Code 330)			Bachelor of Arts Degree	
			quarter hours	
Distribution Requirements				
See page 00 for courses included in the categories listed below:				
Math-Science				18
Social Sciences				24
Arts and Sciences Program Requirements				
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
Modern Language			Elementary or Conversational	12
			Intermediate	12
Core Major Courses—All Courses Required				
30.308	30.309		Expository and Persuasive Writing 1, 2	6
30.310			Expository Communications	3
30.341			English Literature to 1700	3
30.342			English Literature: Reason and Romanticism	3
30.343			English Literature: Victorians and Moderns	3
30.344			Early American Literature: Faith, Reason, and Nature	3
30.345			American Romantics and American Realists	3
30.346			American Literature: The Modern Temper	3
30.450			Shakespeare the Dramatist	3
30.451			Major Figures in Poetry	3
30.452			Major Figures in Fiction	3
30.453			The Ancient and Medieval Worlds	3
30.454			From Renaissance to Romanticism	3
30.455			From Realism to Modern Literature	3
<i>Select One of Two Concentrations:</i>				
I. Literature Elective Concentration—Nine Courses				27
Select nine courses from among those listed in Section C of the English Course Descriptions on pages 173–175 of this <i>Bulletin</i> .				
II. Writing Elective Concentration—Nine Courses				27
Select six courses from Section A of the English Course descriptions on pages 171–172, and select three courses from either Section B on pages 172–173, or from among the Journalism courses listed on pages 179–180.				
English Electives (may include 30.391, 30.392, 30.393, Honors Programs 1, 2, 3)				9
Special arrangements may be made to take 30.395 and 30.396, Directed Studies 1 and 2, to substitute for an upper-level concentration requirement when the course(s) is not available on a regularly scheduled basis. Consult course descriptions for details.				
Open Electives				18
Total Credits				174
English (Major Code 330)			Bachelor of Science Degree	

English (Major Code 330)		Bachelor of Science Degree	
Unless otherwise stated, requirements are the same as for the B.A. degree, except:			
Modern Language		None	
Open Electives		42	



Technical Communications (Major Code 380)

Bachelor of Science Degree

The Bachelor of Science Degree in Technical Communications is available to students who have acquired an Associate in Science Degree or its equivalent (including the completion of English 1, 2, and 3) while maintaining a 2.0 grade point average. Once a student has had sufficient training in Technical Communications, a cooperative job placement option will be made available to him/her through the University College Cooperative Education Program.

Distribution Requirements for the B.S. Degree		quarter hours
A.S. degree or its equivalent		84–96
Core Communications courses		27
Core Technology courses		29
Specialized Communications courses		18
Open electives		15
To equal		173–185

A. Core Communications Courses—Required

		Humanities or Social Science Courses*	9
27.420		Graphics Communication and Production	3
37.316		Oral Collaboration	3
30.308	30.309	Expository and Persuasive Writing 1, 2	6
30.413		Editing for Science and Technology	3
40.325		Business Research Tools	3

B. Core Technology Courses—Required**

10.681	10.682	Introduction to Math 1, 2	8
10.683		Applied Math and Statistics	3
93.550	93.551	Concepts of Modern Technology 1, 2	6
93.552		Measurement and Analysis	3
93.554		Theory and Operation of Computers	3

Select two of the following:

49.321		COBOL Programming 1	3
49.327		FORTRAN Programming 1	3
49.340		Introduction to Programming in BASIC	3
93.553		Modern Electronics	3

C. Specialized Communications Courses—Required

30.410	30.411	Technical Writing 1, 2	6
--------	--------	------------------------	---

Select four of the following:

30.415		Proposal Writing	3
30.420	30.421	Hardware Technical Manual Writing 1, 2	6
30.425	30.426	Computer Software Technical Writing 1, 2	6
30.430		The Business and Technical Presentation	3

D. Cooperative Work Experience

An option for eligible students.

*See page 68 for courses included in these categories.
**Descriptions for courses beginning with 06.--- and 93.--- may be found in the *Lincoln College Bulletin*.

E. Open Electives*

15

It is suggested that students select open electives from among the following courses to reflect individual interest:

06.645		Assembly Language	4
06.670		Introduction to CPU Hardware	4
06.675		CPU Hardware Architecture	4
30.310		Expository Writing and Communication 3	3
41.301	41.302	Accounting Principles 1, 2	6
41.405	41.406	Cost Accounting 1, 2	6
45.301	45.302	Introduction to Business and Management 1, 2	6
51.306		Methods and Materials 1	3

*Descriptions for courses beginning with 06.--- and 93.--- may be found in the *Lincoln College Bulletin*.

Recommended Course Sequence

For maximum learning benefit, students are encouraged to undertake studies in the following sequence, adjusting length of study to course load (e.g., students taking two courses per quarter will take two years to complete Sequence 1, or less than two years if study in the Summer quarter is elected). Assistance for such decisions may be obtained by contacting the Department of Career and Academic Counseling at 617-437-2400.

First Year Sequence

Fall Quarter		Spring Quarter	
37.316	Humanities or Social Science Course	30.309	Humanities or Social Science Course
10.681	Oral Collaboration	10.683	Expository and Persuasive Writing 2
93.550	Introduction to Math 1		Applied Math and Statistics
	Concepts of Modern Technology 1	93.552	Measurement and Analysis
Winter Quarter			
30.308	Humanities or Social Science Course		
10.682	Expository and Persuasive Writing 1		
93.551	Introduction to Math 2		
	Concepts of Modern Technology 2		

Second Year Sequence 2

Fall Quarter		Spring Quarter	
40.325	Business Research Tools	30.413	Editing for Science and Technolgoy
30.410	Technical Writing 1	30.430	The Technical Presentation
	Technology Elective*		Technology Elective*
	Open Elective		Open Elective
Winter Quarter			
27.420	Graphics Communication and Production		
30.411	Technical Writing 2		
93.554	Theory and Operation of Computers		
	Open Elective		
	Open Elective		

*Course selection from Module 2.

Third Year Sequence 3

Fall Quarter		Spring Quarter	
30.415	Proposal Writing		University College Co-op Program
30.420	Hardware Technical Manual Writing 1		Open Elective (optional)
30.425	Computer Software Technical Writing 1		
	Open Elective		
Winter Quarter			
30.421	Hardware Technical Manual Writing 2		
30.426	Computer Software Technical Writing 2		
	Open Elective		

Fine Arts (Major Code 327)

Bachelor of Arts Degree

quarter hours

Distribution Requirements

See page 68 for courses included in these categories listed below:

Math-Science	18
Social Science	24

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
			Elementary or Conversational	12
			Intermediate	12

Major Concentration Courses—Required

27.301	Introduction to Art	3
27.304	History of Art	3
27.305	History of Art to the Sixteenth Century	3
27.306	History of Art to the Twentieth Century	3

In addition, the major requires a minimum of 39 quarter hours from the Fine Arts course offerings described on pages 162–165.

39

Electives

48

Total Credits

174

Special arrangements may be made to take 27.395 and 27.396, Directed Studies 1 and 2, to substitute for an upper-level concentration requirement when the course(s) is not available on a regularly scheduled basis. Consult course descriptions for details.

Fine Arts (Major Code 327)

Bachelor of Science Degree

quarter hours

Distribution Requirements

See page 68 for courses included in these categories listed below:

Math-Science	18
Social Science	24

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
--------	--------	--------	---	---

Major Concentration Courses—Required

27.301	Introduction to Art	3
27.304	History of Art	3
27.305	History of Art to the Sixteenth Century	3
27.306	History of Art to the Twentieth Century	3

In addition, the major requires a minimum of 39 quarter hours from the Fine Arts course offerings described on pages 162–165.

39

Electives

72

Total Credits

174

Special arrangements may be made to take 27.395 and 27.396, Directed Studies 1 and 2, to substitute for an upper-level concentration requirement when the course(s) is not available on a regularly scheduled basis. Consult course descriptions for details.

History (Major Code 323)**Bachelor of Arts Degree****quarter hours****Distribution Requirements**

See page 68 for courses included in these categories listed below:

Math-Science	18
Humanities	24

Social Science RequirementsEighteen quarter hours from at least three of the following disciplines:
economics, political science, psychology, sociology/anthropology.

18

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
			Elementary or Conversational	12
			Intermediate	12

Major Concentration Courses—Required

23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
23.300			The Historian's Craft	3
23.324			European Social and Economic History to 1000	3
23.325			European Social and Economic History, 1000–1648	3
23.339			European Intellectual History Since 1815	3
23.361			Colonial America	3
23.368			American Social History	3
23.385			China Since 1850	3
23.389			Africa Since 1885	3
23.408			History of Energy	3

***Electives** 36**Total Credits** 174

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to pages 159 and 160.

History (Major Code 323)

Bachelor of Science Degree

quarter hours

Distribution Requirements

See page 68 for courses included in the category below:

Humanities

24

Arts and Sciences Program Requirements

30.305 30.306 30.307 English 1, 2, 3 (required prior to matriculation)

9

Major Concentration Courses—Required

23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
23.300			The Historian's Craft	3
23.324			European Social and Economic History to 1000	3
23.325			European Social and Economic History, 1000–1648	3
23.320			Population in History	3
23.339			European Intellectual History Since 1815	3
23.361			Colonial America	3
23.368			American Social History	3
23.369			American Economic History	3
23.385			China Since 1850	3
23.389			Africa Since 1885	3
23.407			Technological Transformation of Society	3
23.408			History of Energy	3

Social Science Requirements

History majors are required to select two of the following course sequences for a total of 18 q.h.

19.301	19.302	19.303	Psychology 1, 2, 3	9
20.301	20.302	20.303	Anthropology 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9

Other Required Courses

21.312	21.313	21.314	Social Research Methods 1, 2, 3	12
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6

*Electives

51

While students may elect courses in their major field in excess of the minimum number required, they are encouraged to elect courses in a variety of fields beyond the major.

Total Credits

174

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to pages 159 and 160.

Arts and Sciences (Major Code 372)

Associate in Science Degree

quarter hours

Distribution Requirements

See page 68 for courses included in the categories listed below:

Math-Science	18
Humanities	24
Social Sciences	24
30.305 30.306 30.307 English 1, 2, 3	9
Electives	21
Total Credits	96

Political Science (Major Code 322)				Bachelor of Arts Degree
				quarter hours
Distribution Requirements				
See page 68 for courses included in these categories listed below:				
Math-Science—any combination of courses				18
Humanities				<u>24</u>
				42
Social Science Requirements				
Eighteen quarter hours from at least three of the following social science disciplines: economics, psychology, sociology/anthropology, history.				18
Arts and Sciences Program Requirements				
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
Modern Language			Elementary or Conversational	12
			Intermediate	<u>12</u>
				33
Courses Required for Major				
Prerequisites				
22.403	Introduction to Politics			3
22.404	Introduction to American Government			3
22.405	Introduction to Comparative Government			<u>3</u>
				9
Upperclass Courses—Required				
American Government (any three American Government courses)				9
Comparative Government (22.329, Comparative Politics Intensive required, 4 q.h.;				
one other Comparative Government course, 3 q.h.)				7
International Relations (22.335, International Relations required, 4 q.h.;				
one other International Relations course, 3 q.h.)				7
Theory and Methodology (22.336, Intro. to Political Theory required, 4 q.h.;				
one other Theory or Methodology course, 3 q.h.)				<u>7</u>
				30
Political Science Electives				
Select any combination of six additional Political Science courses.				18
Open Electives*				24
Total Credits				174

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to p. 157.

Political Science (Major Code 322)**Bachelor of Science Degree****quarter hours****Arts and Sciences Program Requirements**

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
--------	--------	--------	---	----------

Courses Required for Major**Prerequisites**

22.403	Introduction to Politics	3
22.404	Introduction to American Government	3
22.405	Introduction to Comparative Government	<u>3</u>
		9

Upperclass Courses—Required

American Government (any three American Government courses)	9
Comparative Government (22.329, Comparative Politics Intensive required, 4 q.h.;	
one other Comparative Government course, 3 q.h.)	7
International Relations (22.335, International Relations required, 4 q.h.;	
one other International Relations course, 3 q.h.)	7
Theory and Methodology (22.336, Intro. to Political Theory required, 4 q.h.;	
one other Theory or Methodology course, 3 q.h.)	<u>7</u>
	30

Political Science Electives

Select from page 80: may include maximum number of q.h. for Honors and Directed Study.	18
--	-----------

Additional Requirements

39.311	Statistics 1	3
39.312	Statistics 2	3
39.313	Forecasting and Other Topics in Statistics	3
or	or	
49.310	49.311	Introduction to Data Processing and Information
		Systems 1, 2
		6
49.320	Introduction to COBOL Programming	<u>3</u>
		9

Social Science Requirements

Must include not fewer than 6 q.h. from each of three different social science disciplines selected from economics, history, psychology, and sociology/anthropology, other than political science.	18
--	-----------

Humanities**9****Open Electives*****72****Total Credits****174**

*See Optional Public Administration concentration on following page.

Optional Public Administration Concentration (open only to B.S. Degree candidates)		quarter hours
Required courses:		
22.316	Public Administration 1	3
22.317	Public Administration 2	3
22.308	Research Methods	3
22.306	American Political Thought	3
		12
Two of the following:		
22.310	Public Budgeting	3
22.311	Public Personnel Administration	3
22.406	Organizational Theory	3
		6
Seven of the following:		
22.309	Public Policy Analysis	3
22.314	American Constitutional Law	3
22.312	Urban Metropolitan Government	3
22.332	International Organization	3
22.318	Government and Politics of the State	3
22.320	American Presidency	3
22.328	Procedural Due Process	3
22.370	Consumer Advocacy	3
22.315	Civil Rights	3
22.351	Current Political Issues	3
		21
One Political Science Elective		3
Total credits required		42

Psychology (Major Code 319)**Bachelor of Arts Degree****quarter hours****Distribution Requirements**

See page 68 for courses included in these categories:

Math-Science	18
Humanities	24

Social Science Requirements

Eighteen quarter hours from at least three of the following social science disciplines: political science, sociology/anthropology, history, economics.	18
--	----

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
			Elementary or Conversational	12
			Intermediate	12

Major Concentration Courses—Required*

Students planning to continue their education beyond the B.A. or B.S. are encouraged to take Scientific Foundations of Psychology 1 and 2 (19.361 and 19.362).

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
19.304	19.305	19.306	Statistics in Psychology 1, 2, 3	9
19.371			Senior Seminar	3

Three of the following pairs—Required

19.314	19.315	Personality 1, 2 (Lab) (6)	
19.338	19.340	Learning 1, 2 (Lab) (6)	
19.349	19.350	Sensation & Perception 1, 2 (Lab) (6)	
19.380	19.381	Physiological Psychology 1, 2 (Lab) (6)	18

Psychology Electives (19.---series)

21

Open Electives

21

While students may elect courses in their major field in excess of the minimum number required, they are encouraged to elect courses in a variety of fields beyond the major.

Total Credits**174**

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to p. 150.

Psychology (Major Code 319)

Bachelor of Science Degree

quarter hours

Distribution Requirements

See page 68 for courses included in this category:

Math-Science

33

Arts and Sciences Program Requirements

30.305 30.306 30.307 English 1, 2, 3 (required prior to matriculation)

9

Major Concentration Courses—Required*

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
19.304	19.305	19.306	Statistics in Psychology 1, 2, 3	9
19.371			Senior Seminar	3
19.314	19.315		Personality 1, 2 (Lab)	6
19.338	19.340		Learning 1, 2 (Lab)	6
19.349	19.350		Sensation and Perception 1, 2 (Lab)	6
19.380	19.381		Physiological Psychology 1, 2 (Lab)	6

Psychology Electives (19.---series)

15

Open Electives

72

Students planning to continue their education beyond the B.A. or B.S. are encouraged to take Scientific Foundations of Psychology 1 and 2 (19.361 and 19.362).

Total Credits

174

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to p. 150.

Sociology-Anthropology (Major Code 321)**Bachelor of Arts Degree****quarter hours****Distribution Requirements**

See page 68 for courses included in these categories:

Math-Science	18
Humanities	24

Social Science Requirements

Eighteen quarter hours from at least three of the following social science disciplines: psychology, political science, history, economics. 18

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
Modern Language			Elementary or Conversational	12
			Intermediate	12

Major Concentration Courses—Required*

Core Courses:

21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
or			or	or
21.304			Introduction to Sociology (Intensive)	9
20.301	20.302	20.303	Anthropology 1, 2, 3	9
21.312	21.313	21.314	Social Research Methods 1, 2, 3	12
21.317	21.318	21.319	Social Theory 1, 2, 3	9
or			or	or
21.425			Social Theory (Intensive)	9

Sociology-Anthropology Electives: (20.--- or 21.---series) 21

At least 9 q.h. must be in anthropology (see pages 150–151). Students may take any combination of Honors and Field Work totaling three courses.

Open Electives 21–22**Total Credits 174**

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to pp. 153 and 154.

Sociology-Anthropology (Major Code 321)

Bachelor of Science Degree

quarter hours

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
--------	--------	--------	---	---

Distribution Requirements

See page 68 for courses included in the categories below:

Social Sciences (other than Sociology-Anthropology)	18
---	----

Major Concentration Courses—Required*

Core Courses:

21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
or			or	or
21.304			Introduction to Sociology (Intensive)	9
20.301	20.302	20.303	Anthropology 1, 2, 3	9
21.312	21.313	21.314	Social Research Methods 1, 2, 3	12
21.317	21.318	21.319	Social Theory 1, 2, 3	9
or			or	or
21.425			Social Theory (Intensive)	9

Sociology-Anthropology Electives: (20.--- or 21.---series)	39
---	----

At least 9 q.h. must be in anthropology (see pages 150–151). Students may take any combination of Honors and Field Work totaling three courses.

Open Electives**	69–70
-------------------------	-------

While students may elect courses in their major fields in excess of the minimum requirements, B.S. students especially are strongly encouraged to elect courses in math-science and the humanities to achieve adequate educational breadth.

Total Credits	174
----------------------	-----

*Students may be eligible to enroll in Honors and/or Directed Study courses. Please refer to pp. 153 and 154.

**See Human Services Elective Concentration on following page.

Human Services Elective Concentration

quarter hours

Students majoring in the B.S. degree in Sociology-Anthropology may also pursue a concentration in Human Services.

Required Courses

25.343	25.344	25.345	Introduction to Social Work Practice 1, 2, 3	9
25.350			Human Service Professions	3
25.351			Sociology of Human Service Organizations	3
25.352			Evaluation of Social Intervention	3
21.347			Social Problems	3
21.354			Sociology of Inequality	3

Additional Requirements

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
19.341	19.342	19.343	Abnormal Psychology 1, 2, 3	9
				42

Human Services Concentration students are encouraged to consider selecting electives from among the following courses:

19.311	19.312	19.313	Developmental Psychology 1, 2, 3
19.314			Personality
21.334			Social Control
21.346			Sociology of Deviant Behavior
21.350			Juvenile Delinquency
21.353	21.354		Intergroup Relations 1, 2
21.360			Medical Sociology
21.361			Sociology of Mental Health
21.362			Social Gerontology: The Aged in Society
22.309			Public Policy Analysis
22.315			Civil Rights
22.316	22.317		Public Administration 1, 2
39.341			Medical Economics
39.343			Poverty and Discrimination
39.357			Manpower and Anti-Poverty Policies and Programs

Music (Major Code 328)

Bachelor of Arts Degree

quarter hours

Distribution Requirements

See page 68 for courses included in these categories:

Math-Science	18
Social Sciences	24

Arts and Sciences Program Requirements

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
			Elementary or Conversational	12
			Intermediate	12

Core Major Courses—All Required

28.424			Fundamentals of Music Theory	4
28.425	28.426		Music Theory 1, 2	8
28.409			Form and Analysis	3
28.431	28.432	28.433	Piano Class 1, 2, 3 (or advanced level, if qualified)	9

Select One of Two Concentrations:

I. Musical Performance Concentration

28.415		Conducting I	3
28.418		Music Teaching in Studio and Classroom	3
Music History		Select Two Periods	6
Applied Music		Depending on level of musical competency,* select three workshops or chamber groups, master, or ensemble classes, or instrument tutorial from among Applied Music listings, Section B, beginning on page 168.	9

II. Music History Concentration—All Required

28.305		Medieval and Renaissance	3
28.306		Music of the Baroque	3
28.324		The World of Opera	3
28.326		Jazz: Evolution and Essence	3
28.403		Music History of the Classical Period	3
28.404		Music History of the Romantic Era	3
28.410		Music History of the Twentieth Century	3

Music Concentration Electives (28.---series)	15
--	----

Open Electives	39
----------------	----

Total Credits	174
---------------	-----

*To determine level, contact Professor Robin Hendrich in 126 Hayden Hall.

Music (Major Code 328)

Bachelor of Science Degree

Unless otherwise stated, requirements are the same as for the B.A. degree except:	
Modern Language	None

Humanities Electives (other than music courses)	15
---	----

Open Electives	48
----------------	----

Total Credits	174
---------------	-----

Chemical-Biological Technology (Major Code 803)**Associate in Science Degree****quarter hours**

The program in Chemical-Biological Technology helps provide the chemistry and biology foundation required by medical and industrial laboratory assistants and technicians in clinically, chemically, or biologically oriented organizations, and for persons having paramedical responsibilities. Employment opportunities are in hospitals, health clinics, research foundations, chemical and drug industries, public health organizations, water and sanitation departments, and in the emerging fields of the oceanographic technologies.

Prerequisite: Satisfactory completion of the Mathematics Placement Test or the Basic Mathematics 1 and 2 courses (10.671 and 10.672). The Mathematics Placement Test must be taken prior to registration.

Note: Associate degree graduates may transfer applicable credits toward the requirements in Lincoln College programs leading to the Associate in Engineering, Associate in Science, or Bachelor of Engineering Technology degrees, as well as University College programs.

quarter hours**First Year**

10.627	10.628	10.629	Mathematics 1, 2, 3	9
or			or	or
10.607	10.608		College Algebra and Introduction to Calculus	8
11.604	11.605	11.606	General Physics 1, 2, 3	6
12.444	12.445	12.446	General Chemistry 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9

Second Year

10.316	10.317	10.318	Probability and Statistics 1, 2, 3	6
or			or	or
10.620	10.621		Calculus 1 and Calculus A	8
			Social Science Electives (3)	9
18.411	18.412	18.413	Biology 1, 2, 3	12

Third Year

12.431	12.432	12.433	Organic Chemistry 1, 2, 3	12
or			or	or
12.421	12.422	12.423	Analytical Chemistry 1, 2, 3	9
18.424	18.425	18.426	Human Anatomy and Physiology 1, 2, 3	9
			Humanities Electives (3)	9

Fourth Year

18.421	18.422	18.423	Microbiology 1, 2, 3	
			Chemistry or Biology Electives	
			(as needed to complete total credits)	9

Total Credits**96-100**

Chemical-Biological Technology (Major Code 804)

Bachelor of Science Degree

The Chemical-Biological Technology program is an interdisciplinary program integrating theoretical and laboratory course sequences from the fields of chemistry and biology, which gives the opportunity for the student to prepare to assume responsibilities in laboratory careers that emphasize laboratory application and teaching careers in general science. Employment opportunities may be found in a wide variety of industrial, pharmaceutical, clinical, and hospital laboratories dealing with analytical, production, and research functions, and in secondary school education in the teaching of general science, chemistry, biology, and other related courses.

Prerequisite: Satisfactory completion of the Mathematics Placement Test or the Basic Mathematics 1 and 2 courses (10.671 and 10.672). The Mathematics Placement Test must be taken prior to registration.

General Science Teacher Option—Students planning to apply to the University's graduate Boston-Bouvé College of Human Development Professions must include courses in Adolescent Psychology and Principles of Teaching among the electives.

				quarter hours
First Year				
10.627	10.628	10.629	Mathematics 1, 2, 3	9
or			or	or
10.607	10.608		College Algebra and Introduction to Calculus	8
11.604	11.605	11.606	General Physics 1, 2, 3	6
12.444	12.445	12.446	General Chemistry 1, 2, 3	9
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
Second Year				
10.316	10.317	10.318	Probability and Statistics 1, 2, 3	6
or			or	or
10.620	10.621		Calculus 1 and Calculus A	8
18.411	18.412	18.413	Biology 1, 2, 3	12
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
Third Year				
12.421	12.422	12.423	Analytical Chemistry 1, 2, 3	9
18.424	18.425	18.426	Human Anatomy and Physiology 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
Fourth Year				
12.431	12.432	12.433	Organic Chemistry 1, 2, 3	12
18.421	18.422	18.423	Microbiology 1, 2, 3	9

Program continues on next page.

Fifth Year

18.451	18.452	18.453	Histology-Organology 1, 2, 3	6
39.301	39.302	39.303	Economic Principles 1, 2, 3	9
12.451	12.452		Instrumental Analysis 1, 2	6
12.453			Radiochemistry	3
16.331	16.332	16.333	Oceanology 1, 2, 3	9
or			or	or
16.334	16.335		Fisheries Oceanology 1, 2	6
16.336			Marine Resources	3

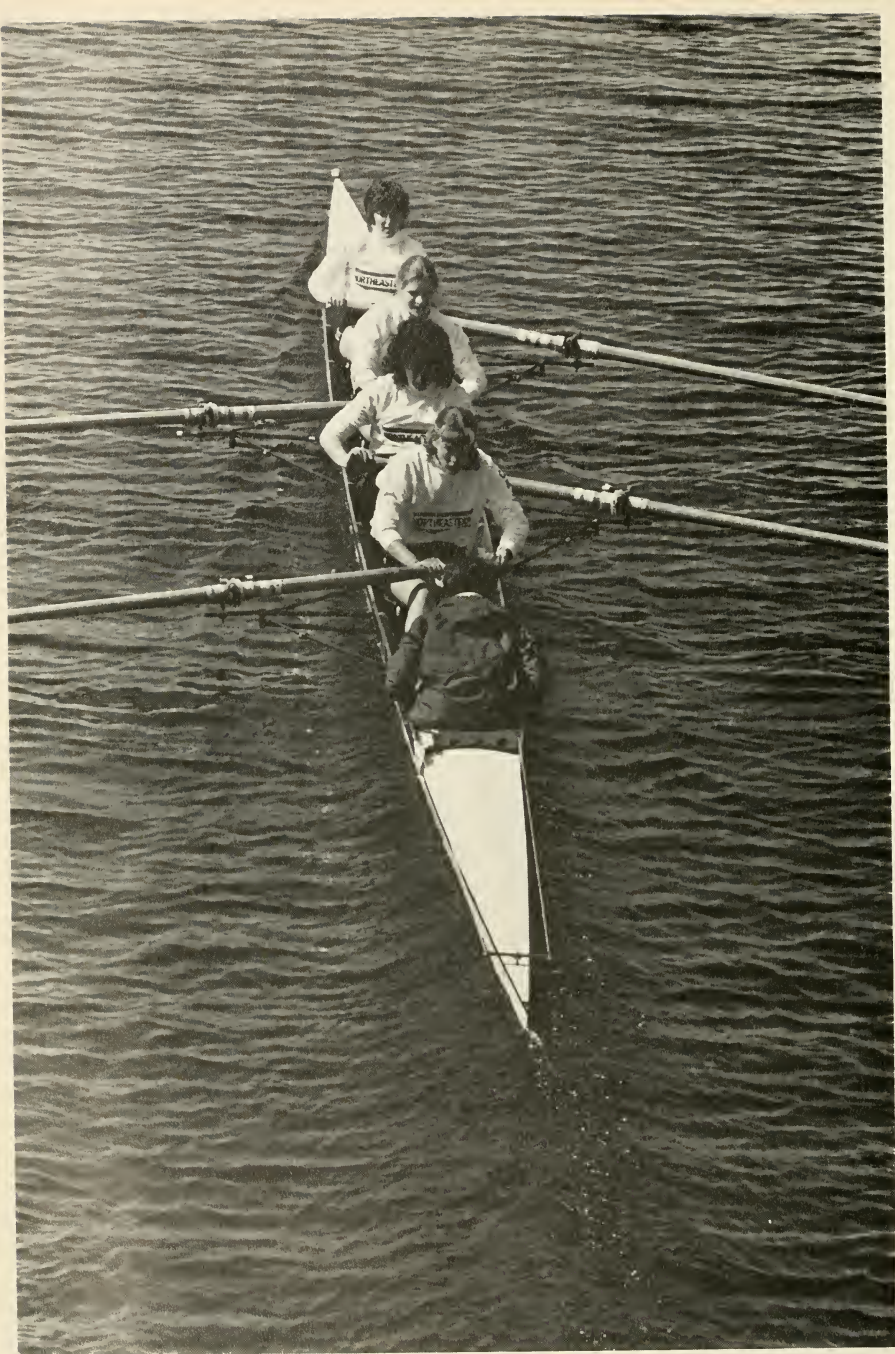
Sixth Year

18.461	18.462	18.463	Ecology 1, 2, 3	9
12.441	12.442	12.443	Physical Chemistry 1, 2, 3	9
or			or	or
12.415	12.416	12.417	Biochemistry 1, 2, 3	9
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3

Seventh Year

18.457	18.458		Genetics 1, 2	6
or			or	or
18.431	18.432		Cell Biology 1, 2	6
18.459			Genetics Lab	2
or			or	or
18.433			Cell Biology Lab	2
			Electives as needed to complete total credits	

Total Credits**175-178**



Law Enforcement

Timothy F. Moran, Associate Dean
Director, Law Enforcement Programs
Telephone 437-3324

Aims

Law Enforcement programs of study are offered to help meet the needs of present and potential practitioners in the fields of Corrections, Law Enforcement, and Security who wish to have the opportunity to acquire a liberal education as well as professional competence or to gain recognition for development and attainment while pursuing a career in that profession. Classes are tailored to suit the shifting tours of duty of many of its students, with the result that day and evening students meet on common ground. These students reflect broad differences in age, as well as in occupation, goals, race, and religion.

Programs

The distribution requirements, including certain required courses, are shown with each curriculum. Upon petition, students may be permitted under certain circumstances to substitute other courses that will more adequately serve their specific objectives.

To provide a balanced program that will achieve the established objectives, the faculty has set minimum requirements in the areas of study outlined on the following pages.

Bachelor of Science Degree Program Major fields of study are offered in Correctional Practices, Law Enforcement, and Security. Students should choose their major field of study in consultation with a program adviser.

Each curriculum provides for not less than 174 quarter hours of work, including at least 75 quarter hours of advanced work in a major field.

No student who has transferred from another institution is eligible to receive a degree until at least 45 quarter hours of academic work have been completed at University College of Northeastern University immediately preceding graduation.

Associate in Science Degree Program The program leading to the associate degree is offered for those who wish to obtain a general background in Correctional Practices, Law En-

forcement, or Security and who later may wish to pursue a major field of concentration for the baccalaureate degree.

Candidates for the Associate in Science degree must complete a minimum of 96 quarter hours of credit. This is approximately one half of the requirements for the Bachelor of Science degree and includes at least 48 quarter hours of work in a major field.

Honors Program The Honors Program in the field of Law Enforcement is designed to provide qualified students with the opportunity to achieve a broader and deeper intellectual academic experience within their chosen fields: Corrections, Law Enforcement, or Security.

In general, the Honors Program consists of the following areas: independent study, directed reading seminar, independent research projects, and special seminars.

The particular academic structure of a student's Honors Program will be arranged in consultation with the Program Director and the Honors Faculty Committee.

The Honors Program is open to all matriculated Law Enforcement Program students in University College who have obtained an associate degree or equivalent and a minimum cumulative grade point average of 3.0. Students who are eligible for this program may apply for admission and approval to the Director of Law Enforcement Programs.

For course numbers, see page 216.

Credit for Noncollegiate Experience (NCE)—Advanced Standing Credit

A matriculated University College student with a department major in Corrections, Law Enforcement, or Security may obtain up to 18 quarter hours of credit (excluding CLEP) by petitioning to take a comprehensive examination in the specific subject area based upon the student's knowledge acquired in a nontraditional manner. Petitions for these examinations may be obtained in Room 102 or 200 Churchill Hall.

In no case will this credit be considered as partial fulfillment of the residence requirement or will a letter grade be assigned.

No credit will be assigned in this manner for courses that can be accredited through the CLEP

or PEP Testing Programs at the time of the petition. Credit will be assigned only to specific courses. It is possible that this credit may be applicable toward a degree in University College only.

Course Sequence

Upon completion of the required courses for matriculation, the student should elect courses from the Core and Major Concentration areas in fulfilling the requirement for the Associate in Science and the Bachelor of Science degrees.

The completion of degree requirements may be accomplished at the student's own pace. A total of 32 courses is required for an associate in science degree, which can be completed over a period of three years, or nine academic quarters. A bachelor of science degree can be completed over a period of five years, or fifteen academic quarters. This schedule will average out to four courses per academic quarter.

Refer to page 27, Academic Policies/Maximum Course Load.

Intensive Courses Many courses are frequently offered as single-quarter intensives during the regular school year. Please refer to the listing of courses on pages 217–218.

Intensive courses offer students the opportunity to achieve their objectives in a shorter period of time.

Distribution Requirements For the purpose of satisfying the distribution requirements in all Law Enforcement programs, students should discuss their academic programs with an academic adviser before attempting to undertake their programs of study.

Courses 30.305, 30.306, 30.307, English 1, 2, 3 (9 quarter hours), must be taken by each student prior to matriculation. (Refer to page 27 regarding matriculation.) The remaining required courses, amounting to 33–36 quarter hours, should be taken from the distribution of the Basic Required, Core Required, and Major Concentration Courses as listed on the following pages.

Field Work Courses Field Work Courses provide an opportunity for students to apply their academic background to practical experience in the areas of Law Enforcement, Corrections, and Security. Course is numbered as 94.499.

A field work course shall comprise the following characteristics:

1. A one-quarter course worth six quarter hours of credit.

2. Only matriculated majors may register.

3. Prior to registration, each student should consult with the Program Director.

4. Each student shall meet with the departmental field work adviser as frequently as the adviser feels necessary, but in any case no fewer than three times per quarter (once to formulate the program of field work experience, once to discuss ongoing work, and once to transmit and discuss the written report).

5. Each student shall spend a minimum of fifteen hours per week at the outside agency on a volunteer or paid basis.

6. The student's grade shall be dependent upon both the quality of the experience as demonstrated in the final report and the discussions between the U.C. field work adviser and the outside supervisor.

7. Each student shall make his or her own arrangements for carrying on suitable field work at a departmentally acceptable agency involving field work experience.

8. The Program Director will participate in a student's placement solely in an advisory capacity.

quarter hours

Law Enforcement

30.305	30.306	30.307	English 1, 2, 3	9
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
94.325	94.326		Introduction to Criminalistics 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6
94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9

Correctional Practices

30.305	30.306	30.307	English 1, 2, 3	9
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
94.322	94.323		Correctional Administration 1, 2	6
94.327			The American Correctional System	3
94.338	94.339		Criminology 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6
94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9

Security

30.305	30.306	30.307	English 1, 2, 3	9
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
22.314			American Constitutional Law	3
45.301	45.302		Introduction to Business and Management 1, 2	6
94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6
94.403	94.404		Security Administration 1, 2	6

Correctional Practices (Major Code 944)**Bachelor of Science Degree****quarter hours****Basic Courses—Required**

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9
94.361	94.362		Law Enforcement Mathematics 1, 2	6
or			or	or
41.301	41.302		Accounting Principles 1, 2	6

Core Courses—Required

21.334			Social Control	3
21.347			Social Problems	3
94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9
49.400	49.401		Human Relations in Organizations 1, 2	6

Core Electives

Select 33 quarter hours from the following:

19.324	19.325		Social Psychology 1, 2	6
19.341	19.342	19.343	Abnormal Psychology 1, 2, 3	9
20.301	20.302	20.303	Anthropology 1, 2, 3	9
21.353	21.354		Intergroup Relations 1, 2	6
21.356			Sociology of Inequality	3
21.357			Urban Sociology	3
22.306			American Political Thought	3
22.313			Political Parties and Pressure Groups	3
22.314			American Constitutional Law	3
21.315			Civil Rights	3
22.316	22.317		Public Administration 1, 2	6
22.328			Procedural Due Process	3
22.333			Formulating American Foreign Policy	3
22.370	22.371	22.372	Consumer Advocacy 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
36.401	36.402		American Sign Language 1, 2	8
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9

Major Concentration Courses—Required

94.301			Human Rights in Corrections	3
94.303			Correctional Counseling	3
94.311	94.312		Advanced Correctional Practices 1, 2	6
94.327			The American Correctional System	3
94.330	94.331		Treatment of Offenders 1, 2	6
94.332	94.333		Correctional Administration 1, 2	6
94.338	94.339		Criminology 1, 2	6
94.341	94.342		Probation and Parole Practices 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6

Elective Major Concentration Courses

A total of 36 quarter hours from the following courses. Not more than 18 quarter hours of seminar courses may be elected to satisfy this requirement.

94.302		Basic Statistics in Law Enforcement	3
94.316		The Law and Institutional Treatment	3
94.317		Comparative Correctional Systems	3
94.318	94.319	Law Enforcement Identification and Records 1, 2	6
94.328	94.329	Social Deviance 1, 2	6
94.340		Delinquency Prevention	3
94.345	94.346	Juvenile Corrections 1, 2	6
94.357		Seminar in Correctional Practices	3
94.358		National Law Enforcement Seminar	3
94.359		Hospital Security	3
94.364		Seminar in L.E.—Youth Crime Control	3
94.365		Seminar in L.E.—Victimology	3
94.366		Seminar in L.E.—International Crime Control	3
94.367		Seminar in L.E.—Grantsmanship	3
94.368		Seminar in L.E.—Operational Intelligence	3
94.370		Seminar in L.E.—Collective Bargaining	3
94.371	94.372	Man, Law, and Society 1, 2	6
94.375		Seminar in L.E.—Organized Crime	3
94.376		Seminar in L.E.—Minorities and the Urban Crisis	3
94.377		Seminar in L.E.—Criminal Behavior	3
94.380		Seminar in L.E.—Intervention Strategies	3
94.383		Seminar in L.E.—Drugs	3
94.384		Seminar in L.E.—Executive Development	3
94.385		Seminar in L.E.—Mental Health and the Police	3
94.386		Seminar in L.E.—Data Processing	3
94.389	94.390	Civil Law in Criminal Justice 1, 2	6
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.395	94.396	Fire Investigation and Arson 1, 2	6
94.397		Law Enforcement Fiscal Management	3
94.398		Massachusetts Criminal Law	3
94.399		Alcohol Problems in Law Enforcement	3
94.415		Domestic Violence	3
94.499		Field Work in Law Enforcement Correctional Practices and Security	6

Total Credits**174**

Additional department offerings on selections of intensive courses appear on pages 217–218.

Correctional Practices (Major Code 945)

Associate in Science Degree

quarter hours

Basic Courses—Required

21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9

Core Courses—Required

94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9
--------	--------	--------	--	---

Core Electives

A total of 21 quarter hours from the following courses:

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
19.324	19.325		Social Psychology 1, 2	6
19.341	19.342	19.343	Abnormal Psychology 1, 2, 3	9
21.334			Social Control	3
21.347			Social Problems	3
21.357			Urban Sociology	3
21.353	21.354		Intergroup Relations 1, 2	6
22.306			American Political Thought	3
22.313			Political Parties and Pressure Groups	3
33.314			American Constitutional Law	3
22.315			Civil Rights	3
22.316	22.317		Public Administration 1, 2	6
22.328			Procedural Due Process	3
22.333			Formulating American Foreign Policy	3
22.370	22.371	22.372	Consumer Advocacy 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
36.401	36.402		American Sign Language 1, 2	8
49.400	49.401		Human Relations in Organizations 1, 2	6

Major Concentration Courses—Required

94.327			The American Correctional System	3
94.332	94.333		Correctional Administration 1, 2	6
94.338	94.339		Criminology 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6

Elective Major Concentration Courses

A total of 21 quarter hours of credit from the following courses. Not more than 9 quarter hours of seminar courses may be elected to satisfy this requirement.

94.301			Human Rights in Corrections	3
94.303			Correctional Counseling	3
94.311	94.312		Advanced Correctional Practices 1, 2	6
94.316			The Law and Institutional Treatment	3
94.320			Basic Statistics in Law Enforcement	3
94.322			Research Methods in Criminal Justice	3

94.328	94.329	Social Deviance 1, 2	6
94.330	94.331	Treatment of Offenders 1, 2	6
94.340		Delinquency Prevention	3
94.341	94.342	Probation and Parole Practices 1, 2	6
94.345	94.346	Juvenile Corrections 1, 2	6
94.357		Seminar in Correctional Practices	3
94.358		The National Law Enforcement Seminar	3
94.365		Seminar in L.E.—Victimology	3
94.371	94.372	Man, Law, and Society 1, 2	6
94.377		Seminar in L.E.—Criminal Behavior	3
94.383		Seminar in L.E.—Drugs	3
94.386		Seminar in L.E.—Data Processing	3
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.399		Alcohol Problems in Law Enforcement	3
94.415		Domestic Violence	3
94.499		Field Work in Law Enforcement, Correctional Practices, and Security	6
Total Credits			96

Additional department offerings on selections of intensive courses appear on pages 217–218.

Law Enforcement (Major Code 940)**Bachelor of Science Degree****quarter hours****Basic Courses—Required**

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9
94.361	94.362		Law Enforcement Mathematics 1, 2	6
or			or	or
41.301	41.302		Accounting Principles 1, 2	6

Core Courses—Required

94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9

Elective Core Courses

A total of 33 quarter hours from the following courses:

19.324	19.325		Social Psychology 1, 2	6
19.341	19.342	19.343	Abnormal Psychology 1, 2, 3	9
21.334			Social Control	3
21.347			Social Problems	3
22.306			American Political Thought	3
22.313			Political Parties and Pressure Groups	3
22.314			American Constitutional Law	3
22.315			Civil Rights	3
22.316	22.317		Public Administration 1, 2	6
22.333			Formulating American Foreign Policy	3
22.370	22.371	22.372	Consumer Advocacy 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
22.328			Procedural Due Process	3
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
29.307			Business and Professional Speaking	3
32.420			Conversational Spanish for the Law Enforcement Professional	3
36.401	36.402		American Sign Language 1, 2	8
39.342			Economics of Crime	3
41.417	41.418		Internal Auditing 1, 2	6
49.400	49.401		Human Relations in Organizations 1, 2	6
49.403			Advanced Human Relations	3
94.501	94.502		Human Behavioral Factors for Security Personnel 1, 2	6
94.503	94.504		Human Behavioral Concepts and Tactics in Police Work 1, 2	6

Major Concentration Courses—Required

94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
94.308	94.309		Interviews and Interrogations 1, 2	6
94.325	94.326		Introduction to Criminalistics 1, 2	6
94.338	94.339		Criminology 1, 2	6
94.343	94.344		L.E. Management and Planning 1, 2	6

94.371	94.372	Man, Law, and Society 1, 2	6
94.387	94.388	Administration of Justice 1, 2	6
94.391	94.392	Criminal Law 1, 2	6

Elective Major Concentration Courses

A total of 42 quarter hours from the following courses. Not more than 18 quarter hours of seminar courses may be elected to satisfy this requirement.

94.302		Basic Statistics in Law Enforcement	3
94.306		Comparative Police Systems	3
94.314	94.315	Traffic Safety and Control 1, 2	6
94.318	94.319	L.E. Identification and Records 1, 2	6
94.320		Police Public Relations	3
94.321		Police Community Relations	3
94.322		Research Methods in Criminal Justice	3
94.323	94.324	The Patrol Function 1, 2	6
94.328	94.329	Social Deviance 1, 2	6
94.335		Investigative Report Writing	3
94.336		Police Supervision	3
94.337		Police Work with Juveniles	3
94.340		Delinquency Prevention	3
94.358		National Law Enforcement Seminar	3
94.364		Seminar in L.E.—Youth Crime Control	3
94.365		Seminar in L.E.—Victimology	3
94.366		Seminar in L.E.—International Crime Control	3
94.367		Seminar in L.E.—Grantsmanship	3
94.368		Seminar In L.E.—Operational Intelligence	3
94.370		Seminar in L.E.—Collective Bargaining	3
94.374		Seminar in L.E.—Interviewing Practicum	3
94.375		Seminar in L.E.—Organized Crime	3
94.376		Seminar in L.E.—Minorities and the Urban Crisis	3
94.377		Seminar In L.E.—Criminal Behavior	3
94.378		Seminar in L.E.—Prosecutive Development	3
94.379		Seminar in L.E.—Forensic Laboratory	3
94.380		Seminar in L.E.—Intervention Strategies	3
94.381	94.382	Civil Liberties and the Police 1, 2	6
94.383		Seminar in L.E.—Drugs	3
94.384		Seminar in L.E.—Executive Development	3
94.385		Seminar in L.E.—Mental Health and the Police	3
94.386		Seminar in L.E.—Data Processing	3
94.389	94.390	Civil Law in Criminal Justice 1, 2	6
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.395	94.396	Fire Investigation and Arson 1, 2	6
94.397		Law Enforcement Fiscal Management	3
94.398		Massachusetts Criminal Law	3
94.399		Alcohol Problems in Law Enforcement	3
94.405		Hazardous Materials	3
94.415		Domestic Violence	3
94.499		Field Work in Law Enforcement, Correctional Practices, and Security	6
94.500		Directed Study—In-Car Seminar By special arrangement	3

Total Credits

174

Additional department offerings on selections of intensive courses appear on pages 217–218.

Law Enforcement (Major Code 941)**Associate in Science Degree****quarter hours****Basic Courses—Required**

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3	9

Core Courses—Required

94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9
--------	--------	--------	--	---

Elective Core Courses

A total of 21 quarter hours from the following courses:

19.324	19.325		Social Psychology 1, 2	6
19.341	19.342	19.343	Abnormal Psychology 1, 2, 3	9
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
21.334			Social Control	3
22.306			American Political Thought	3
22.313			Political Parties and Pressure Groups	3
22.314			American Constitutional Law	3
22.315			Civil Rights	3
22.316	22.317		Public Administration 1, 2	6
22.328			Procedural Due Process	3
22.333			Formulating American Foreign Policy	3
22.370	22.371	22.372	Consumer Advocacy 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
29.307			Business and Professional Speaking	3
32.420			Conversational Spanish for the Law Enforcement Professional	3
36.401	36.402		American Sign Language 1, 2	8
94.501	94.502		Human Behavioral Factors for Security Personnel 1, 2	6
94.503	94.504		Human Behavioral Concepts and Tactics in Police Work 1, 2	6

Major Concentration Courses Required

94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
94.325	94.326		Introduction to Criminalistics 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6

Elective Major Concentration Courses

A total of 24 quarter hours from the following courses. Not more than 6 quarter hours of seminar courses may be elected to satisfy this requirement.

94.302			Basic Statistics in Law Enforcement	3
94.308	94.309		Interviews and Interrogations 1, 2	6
94.314	94.315		Traffic Safety and Control 1, 2	6
94.320			Police Public Relations	3
94.321			Police Community Relations	3
94.322			Research Methods in Criminal Justice	3

94.323	94.324	The Patrol Function 1, 2	6
94.328	94.329	Social Deviance 1, 2	6
94.335		Investigative Report Writing	3
94.336		Police Supervision	3
94.337		Police Work with Juveniles	3
94.338	94.339	Criminology 1, 2	6
94.340		Delinquency Prevention	3
94.358		National Law Enforcement Seminar	3
94.365		Seminar in L.E.–Victimology	3
94.371	94.372	Man, Law, and Society 1, 2	6
94.377		Seminar in L.E.–Criminal Behavior	3
94.383		Seminar in L.E.–Drugs	3
94.386		Seminar in L.E.–Data Processing	3
94.389	94.390	Civil Law in Criminal Justice 1, 2	6
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.395	94.396	Fire Investigation and Arson 1, 2	6
94.398		Massachusetts Criminal Law	3
94.399		Alcohol Problems in Law Enforcement	3
94.405		Hazardous Materials	3
94.415		Domestic Violence	3
94.499		Field Work in Law Enforcement Correctional Practices and Security	6
94.500		Directed Study–In-Car Seminar By special arrangement	3

Total Credits**96**

Additional department offerings on selections of intensive courses appear on pages 217–218.

Security (Major Code 942)**Bachelor of Science Degree****quarter hours****Basic Courses—Required**

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9

Core Courses—Required

22.314			American Constitutional Law	3
41.301	41.302		Accounting Principles 1, 2	6
or			or	or
94.361	94.362		Law Enforcement Mathematics 1, 2	6
45.301	45.302		Introduction to Business and Management 1, 2	6

Elective Core Courses

A total of 36 quarter hours from the following courses:

19.332	19.333	19.334	Industrial Psychology 1, 2, 3	9
22.306			American Political Thought	3
22.313			Political Parties and Pressure Groups	3
22.315			Civil Rights	3
22.316	22.317		Public Administration 1, 2	6
22.328			Procedural Due Process	3
22.333			Formulating American Foreign Policy	3
22.370	22.371	22.372	Consumer Advocacy 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
26.331	26.332	26.333	Ethics 1, 2, 3	9
26.334			Logic	3
29.307			Business and Professional Speaking	3
36.401	36.402		American Sign Language 1, 2	8
41.417	41.418		Internal Auditing 1, 2	6
44.301			Principles of Finance	3
45.405			Industrial Safety	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.376			Computer Privacy and Security	3
49.420	49.421		Labor Management Relations 1, 2	6
94.501	94.502		Human Behavioral Factors for Security Personnel 1, 2	6
94.503	94.504		Human Behavioral Concepts and Tactics in Police Work 1, 2	6

Major Concentration Courses—Required

94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
94.307			Introduction to Industrial Security	3
94.308	94.309		Interviews and Interrogations 1, 2	6
94.352	94.353		Physical Security 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6

94.391	94.392	Criminal Law 1, 2	6
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.403	94.404	Security Administration 1, 2	6
94.406		Legal Aspects of Security Operations	3

Elective Major Concentration Courses

A total of 39 quarter hours from the following courses. Not more than 18 quarter hours of seminar courses may be elected to satisfy this requirement.

94.318	94.319	Law Enforcement Identification and Records 1, 2	6
94.322		Research Methods in Criminal Justice	3
94.323	94.324	The Patrol Function 1, 2	6
94.325	94.326	Introduction to Criminalistics 1, 2	6
94.328	94.329	Social Deviance 1, 2	6
94.335		Investigative Report Writing	3
94.338	94.339	Criminology 1, 2	6
94.340		Delinquency Prevention	3
94.343	94.344	Law Enforcement Management and Planning 1, 2	6
94.350		Document Control	3
94.351		Industrial Fire Prevention	3
94.354		Retail Security	3
94.355		Bank Security Measures	3
94.358		National Law Enforcement Seminar	3
94.359		Hospital Security	3
94.360		Seminar in Security—Current Problems	3
94.365		Seminar in L.E.—Victimology	3
94.368		Seminar in L.E.—Operational Intelligence	3
94.370		Seminar in L.E.—Collective Bargaining	3
94.371	94.372	Man, Law, and Society 1, 2	6
94.375		Seminar in L.E.—Organized Crime	3
94.377		Seminar in L.E.—Criminal Behavior	3
94.389	94.390	Civil Law in Criminal Justice 1, 2	6
94.395	94.396	Fire Investigation and Arson 1, 2	6
94.405		Hazardous Materials	3
94.407		Introduction to Government Security	3
94.415		Domestic Violence	3
94.499		Field Work in Law Enforcement, Correctional Practices, and Security	6

Total Credits

174

Additional department offerings on selections of intensive courses appear on pages 217–218.

Security (Major Code 943)

Associate in Science Degree

quarter hours

Basic Courses—Required

21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
30.305	30.306	30.307	English 1, 2, 3	9

Core Courses—Required

22.314			American Constitutional Law	3
45.301	45.302		Introduction to Business and Management	6

Elective Core Courses

A total of 21 quarter hours from the following courses:

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
19.332	19.333	19.334	Industrial Psychology 1, 2, 3	9
22.306			American Political Thought	3
22.313			Political Parties and Pressure Groups	3
22.315			Civil Rights	3
22.316	22.317		Public Administration 1, 2	6
22.328			Procedural Due Process	3
22.333			Formulating American Foreign Policy	3
22.370	22.371	22.372	Consumer Advocacy 1, 2, 3	9
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
23.304	23.305	23.306	American History 1, 2, 3	9
26.331	26.332	26.333	Ethics 1, 2, 3	9
26.334			Logic	3
29.307			Business and Professional Speaking	3
36.401	36.402		American Sign Language 1, 2	8
41.301	41.302		Accounting Principles 1, 2	6
41.417	41.418		Internal Auditing 1, 2	6
44.301			Principles of Finance	3
45.405			Industrial Safety	3
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2	6
49.376			Computer Privacy and Security	3
49.420	49.421		Labor Management Relations 1, 2	6
94.501	94.502		Human Behavioral Factors for Security Personnel 1, 2	6
94.503	94.504		Human Behavioral Concepts and Tactics in Police Work 1, 2	6

Major Concentration Courses—Required

94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
94.307			Introduction to Industrial Security	3
94.387	94.388		Administration of Justice 1, 2	6
94.391	94.392		Criminal Law 1, 2	6
94.403	94.404		Security Administration 1, 2	6
94.406			Legal Aspects of Security	3

Elective Major Concentration Courses

A total of 18 quarter hours of credit from the following courses. Not more than 9 quarter hours of seminar courses may be elected to satisfy this requirement.

94.307		Introduction to Industrial Security	3
94.308	94.309	Interviews and Interrogations 1, 2	6
94.323	94.324	The Patrol Function 1, 2	6
94.325	94.326	Introduction to Criminalistics 1, 2	6
94.335		Investigative Report Writing	3
94.338	94.339	Criminology 1, 2	6
94.340		Delinquency Prevention	3
94.343	94.344	Law Enforcement Management and Planning 1, 2	6
94.350		Document Control	3
94.351		Industrial Fire Prevention	3
94.352	94.353	Physical Security 1, 2	6
94.354		Retail Security	3
94.355		Bank Security Measures	3
94.358		National Law Enforcement Seminar	3
94.360		Seminar in Security (Current Problems)	3
94.365		Seminar in L.E.—Victimology	3
94.368		Seminar in L.E.—Operational Intelligence	3
94.371	94.372	Man, Law, and Society 1, 2	6
94.375		Seminar in L.E.—Organized Crime	3
94.377		Seminar in L.E.—Criminal Behavior	3
94.389	94.390	Civil Law in Criminal Justice 1, 2	6
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.395	94.396	Fire Investigation and Arson 1, 2	6
94.405		Hazardous Materials	3
94.406		Legal Aspects of Security Operations	3
94.407		Introduction to Government Security Programs	3
94.415		Domestic Violence	3
94.499		Field Work in Law Enforcement Correctional Practices, and Security	6
Total Credits			96

Additional department offerings on selections of intensive courses appear on pages 217–218.



Health Professions Programs

Director, Science and Health Professions Programs
Lana Melnik, Administrative Assistant
Telephone 437-2819

Aims

Programs in Allied Health are offered through University College to help students prepare for advancement and service in hospitals and other health agencies through part-time study.

Degree programs, both associate and baccalaureate, are designed to provide professional specialization and general educational development. All programs are designed to meet the accreditation standards of the Committee on Allied Health Education and Accreditation (C.A.H.E.A.) of the American Medical Association and of licensing or registration boards where such exist.

The Committee on Allied Health Education is responsible for adopting essentials (minimal standards for A.M.A. accreditation) for allied health education programs with the advice of A.M.A. section councils, medical specialty societies, and allied health organizations. The U.S. Commissioner of Education and the nongovernment Council on Post-secondary Accreditation recognize the A.M.A. and collaborating organizations to accredit educational programs for established allied health occupations.

Course Distribution

It is the goal of Northeastern University to offer students a balanced educational background. To this end, the following curriculum design will be in effect for most programs:

Professional and professionally related	35–50%
Basic and Allied Sciences	25–40%
Liberal Arts (nonscience)	25–40%

Students will choose electives to fulfill course distribution requirements and to equal the number of credits required for the specific degree.

Clinical Assignments

Clinical assignments are generally available for students whose programs require directed applied study in a clinical setting. In most instances didactic information is presented at the University while clinical practice is at various hospitals or

other health agencies in the Greater Boston community. Positions for applied clinical studies are often offered on a competitive basis, with the student's academic performance in both didactic and basic professional courses used as the basis for the student's acceptance. Academic credit earned during the practicum is usually applicable toward the degree requirement.

Students accepting clinical assignments in health facilities are expected to adhere to requirements of the facility, all of which are outside University control.

Area Program Directors and Coordinators

Within the University College Health Professions Programs there are several Area Program Directors and Coordinators. Area Program Directors, along with the Associate Dean of University College for Health Professions Programs, have overall responsibility for the academic integrity and quality of the health programs in their areas of specialty. The Program Coordinators for each area serve as the chief academic advisers for students in their programs.

Philip DiSalvio, Program Director and Coordinator for Health Management (Harvard Graduate School of Education); telephone 495-7870.

Prof. Judith Weilerstein, Program Director for Health/Medical Record Administration (College of Pharmacy and Allied Health Professions); telephone 437-3663.

Education Coordinator for Cytotechnology (University College); telephone 437-2819.

Stanley Bozen, Program Director for Radiologic Technology (University College); telephone 437-2818.

Prof. Frank Robinson, Program Director for Therapeutic Recreation Services (Boston-Bouvé College of Human Development Professions); telephone 437-3157.

Eleanor King, Program Director for the Dental Assistant Program (University College); telephone 437-2829.

Prof. Gerald L. Davis, Program Director for Medical Laboratory Science (College of Pharmacy and Allied Health Professions); telephone 437-3665.

Dr. Theodore Blank, Program Director and Coordinator for the B.S. degree program in Health Science (University College); telephone 727-1960.

Barbara Martin, Program Coordinator for MLS (College of Pharmacy and Allied Health Professions); telephone 437-3666.

Annalee Collins, Program Coordinator for Health/Medical Records Administration (College of Pharmacy and Allied Health Professions); telephone 437-3663.

Health Science (Major Code 865)

Bachelor of Science Degree

quarter hours

The Bachelor of Science Degree in Health Science is available to students holding registration or licensure (as defined by University regulations) in a specific health profession and trained in an approved program accredited by the appropriate medical association (American Medical Association, National League of Nursing, American Dental Association, etc.).

All students in this program should consult with an academic adviser.

Distribution Requirements for the B.S. Degree	quarter hours
Liberal Arts (nonscience)	42
Sciences	44
Professional and professionally related	45–48
Electives and/or transfer credit	40–43
To equal	174

A. Liberal Arts (Nonscience)

Required				
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9

Humanities (Recommended Courses)

9

To be selected from areas beginning with the numbers:

- 26. Philosophy and Religion
- 27. Fine Arts
- 28. Music
- 29. Theatre Arts
- 30. English and Technical Communications
- 31.–35. Modern Languages
- 36. American Sign Language
- 37. Speech Communication
- 38. Journalism

Social Sciences (Recommended Courses)

9

To be selected from areas beginning with the numbers:

- 19. Psychology
- 20. Anthropology
- 21. Sociology
- 22. Political Science
- 23. History
- 25. Social Welfare
- 39. Economics

Electives in above areas

15

B. Sciences**Required Basic**

18.411	18.412	.	Biology 1, 2	8
18.424	18.425	18.426	Anatomy and Physiology 1, 2, 3	9
18.421			Microbiology 1	3
10.627	10.628		Mathematics 1, 2	6
or			or	or
10.607	10.608		College Algebra and Introduction to Calculus	8
12.444	12.445	12.446	General Chemistry 1, 2, 3	9
or			or	or
12.407	12.408	12.409	Modern Chemistry 1, 2, 3	9

Required Advanced

To be taken after matriculation in B.S. program, and to be determined by profession.
Select a minimum of 9 q.h. from the following:

18.431	18.432	18.433	Cell Biology 1, 2, 3	8
18.438			Immunology	4
18.420			Medical Microbiology	4
18.457	18.458	18.459	Genetics 1, 2, 3	8
12.431	12.432	12.433	Organic Chemistry 1, 2, 3	12
86.346			Advanced Nutrition	3
86.347			Advanced Pharmacology	3
18.451	18.452	18.453	Histology-Organology 1, 2, 3	6
18.474	18.475		Advanced Human Physiology 1, 2	6
87.310	87.311	87.312	Hematology; Morphologic Hematology 1, 2	9

C. Professional and Professionally Related**General Core Required**

86.303	86.304	Foundations of Medical Science 1, 2	6
86.305		Health Science Statistics	3

General Core Options

Select 18 q.h. from the following:

63.330		Process of Aging	3
86.306		Hospital Law and Ethics	3
86.320	86.321	Principles and Practices of Community Health 1, 2	6
86.322		Principles and Practices of Community Mental Health	3
86.323	86.324	Public Health 1, 2	6
86.325		Health Care Delivery	3
86.326	86.327	Contemporary and Controversial Health Care Issues 1, 2	6
87.313		Epidemiology 1	3
86.329		Environmental Problems and Health	3
86.381		Basic Pharmacology	3
86.380		Basic Nutrition	3

Additional General Core Options for students with a clinical laboratory background:

*18.457	18.458	18.459	Genetics 1, 2, 3	8
*18.431	18.432	18.433	Cell Biology 1, 2, 3	8
*18.438			Immunology	4

12.427			Analytical Chemistry	4
*18.451	18.452	18.453	Histology-Organology 1, 2, 3	6
12.441	12.442	12.443	Physical Chemistry 1, 2, 3	9

General Educational and Administrative—Required

86.307	86.308	Hospital Organization and Management 1, 2	6
86.330	86.331	Health Science Education 1, 2	6

Advanced Professional Options

Courses in professional, health education, or health administration areas to be taken after matriculation into B.S. degree program in Health Science.

Select 6–9 q.h. from the following:

86.348	86.349	Health Care Finance 1, 2	6
86.310	86.311	Applied Health Care Management 1, 2	6
86.322		Methods and Materials of Public Health Education	3
86.333	86.334	Medical Care and Current Social Problems 1, 2	6
86.337		Oral Microbiology	3
86.338	86.339	Advanced Periodontology 1, 2	6
87.314		Epidemiology 2	3
86.312	86.313	Communications for Health Care Personnel 1, 2	6

Additional Advanced Professional Options for students with a clinical laboratory science background:

*87.311	87.312	Morphologic Hematology 1, 2	6
†87.211		Hemostasis	2
†87.222		Histochemistry	2
†87.113		Clinical Immunology	3
†87.213		Immunohematology	2
*18.474	18.475	Advanced Human Physiology 1, 2	6
12.451	12.452	Instrumental Analysis 1, 2	6
12.453		Radiochemistry	3
87.301		Quality Control	2
18.422	18.423	Microbiology 2, 3	6
*18.420		Medical Microbiology	4

D. Electives**Electives and/or transfer credits to equal****174**

*Courses may be utilized in only one category; requirements must be fulfilled in each category.

†Tuition for this course is at the Basic College tuition rate.

Health Management (Major Code 860)**Bachelor of Science Degree****quarter hours**

Includes special concentration of professional courses to prepare for licensure examination in Long Term Care Administration.

Distribution Requirements for the B.S. Degree

Basic Courses	33
Arts and Sciences	45
Management	33
Health Care Administration	30
Health Care Management Concentration Option 1 or 2	33

Basic Courses—Required

10.627	10.628		Mathematics 1, 2	6
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
39.301	39.302	39.303	Economic Principles and Problems 1, 2, 3	9

Arts and Sciences Core Courses—Required

18.411	18.412	18.413	Biology 1, 2, 3	12
18.424	18.425	18.426	Anatomy & Physiology 1, 2, 3	9
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
			Social Science or Humanities Electives	15

Management Courses—Required

86.305		Health Science Statistics	3
41.301	41.302	Accounting Principles 1, 2	6
44.301		Principles of Finance	3
45.301		Introduction to Business and Management 1	3
49.310		Introduction to Data Processing and Information Systems 1	3
86.312	86.313	Communications for Health Care Personnel 1, 2	6
49.404		Personnel Management 1	3
49.373		Information Processing in Medicine	3
45.303		Introduction to Business and Management 3	3

Health Care Administration Courses—Required

86.306		Hospital Law and Ethics	3
86.348	86.349	Health Care Finance 1, 2	6
86.303	86.304	Foundations of Medical Science 1, 2	6
86.300		Medical Terminology Survey	3
86.307	86.308	Hospital Organization and Management 1, 2	6
86.320		Principles and Practices of Community Health 1	3
86.325		Health Care Delivery	3

Option 1 Long Term Care Administration

For licensure as a nursing home administrator, the Board of Registration of Nursing Home Administrators in Massachusetts requires an internship, a licensure examination, and a baccalaureate degree. The required courses in this option help prepare the student for the licensure examination in Massachusetts. Each student, however, is cautioned to contact the Board of Registration of Nursing Home Administrators to ascertain the specific requirements for eligibility to sit for the exam in Massachusetts.

Required Courses

21.363			Social Gerontology	3
*86.440	86.441	86.442	Long Term Care Administration A, B, C	18

*Students who have successfully completed:

86.340 should register for 86.441, followed by 86.440 and 86.442
 86.341 should register for 86.440, followed by 86.441 and 86.442
 86.342 should register for 86.442, followed by 86.441 and 86.440
 86.343 should register for 86.442, followed by 86.441
 86.344 should register for 86.441

Extra credits thus obtained may be credited toward electives.

Electives

Select 12 quarter hours from the following, or other electives with permission of adviser.

63.301	63.302	63.303	Principles and Practices of Therapeutic Recreation 1, 2, 3	9
86.381			Basic Pharmacology	3
86.380			Basic Nutrition Care	3
86.310	86.311		Applied Health Care Management 1, 2	6
86.328			Home Health Care	3
86.329			Environmental Problems and Health	3

Option 2 Community Health Management**Required Courses**

86.310	86.311	Applied Health Care Management 1, 2	6
86.321		Principles and Practices of Community Health 2	3
87.313		Epidemiology 1	3
86.323		Public Health 1	3

Electives

Select 18 quarter hours from the following, or other electives with permission of adviser.

86.322		Principles and Practices of Community Mental Health	3
86.324		Public Health 2	3
86.326	86.327	Contemporary and Controversial Health Care Issues 1, 2	6
86.328		Home Health Care	3
86.329		Environmental Problems and Health	3
21.360		Medical Sociology	3
87.314		Epidemiology 2	3
86.381		Basic Pharmacology	3
86.380		Basic Nutrition	3

Total Credits**174**

Health/Medical Record Administration

The Profession The health/medical record administrator has varied responsibilities relating to health information systems. He/she may organize, operate, and manage medical record services. The program offers the student the opportunity to develop the capability to design health information and retrieval systems; to plan, organize, and direct medical record services; to develop, analyze, and evaluate medical records and indexes; to work with medical and administrative staffs in developing methods for evaluation of patient care, and in research projects utilizing health care information.

The Health/Medical Record Administration Program leading to a B.S. degree has been in effect at Northeastern University since 1966. The professional certification program, open to students already holding baccalaureate degrees and offering the required professional courses, was instituted in 1967.

Northeastern University's programs in Health Record Administration are approved by the Com-

mittee on Allied Health Education and Accreditation in cooperation with the American Medical Record Association.

Candidates who wish to matriculate in this program must be interviewed by the Program Director. Arrangements for this interview may be made through the Health Records Office, 205 Mugar Building. No candidate will be considered as matriculated until this requirement has been met.

In designated professional courses (*), students must obtain a grade of C or better. Only one professional course may be repeated. Students who receive a grade of D in more than one professional course will be asked to withdraw from the program.

Students applying for the clinical sequence of courses (86.375, 86.360, 86.367) must have a quality point average of 2.5 and the approval of their assigned Health Record Program adviser.

Health/Medical Record Administration (Major Code 861) Bachelor of Science Degree**quarter hours**

Successful completion of this program qualifies a student for admission to the professional registration examinations conducted by the American Medical Record Association.

Basic Courses—Required

10.627	10.628		Mathematics 1, 2	6
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
39.301	39.302	39.303	Economic Principles and Practices 1, 2, 3	9

Arts and Sciences Core Courses—Required

18.411	18.412	18.413	Biology 1, 2, 3	12
18.424	18.425	18.426	Anatomy and Physiology 1, 2, 3*	9
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
21.303			Introduction to Sociology: Critical Issues Facing Society	3
22.403			Introduction to Politics	3
22.404			Introduction to American Government	3
22.405			Introduction to Comparative Government	3
or			or	or
23.301	23.302	23.303	History of Civilization 1, 2, 3	9
39.311	39.312		Statistics 1, 2*	6
Humanities			Arts, English, Language, Philosophy, Music	6

Professional and Professionally Related Courses—Required

49.310			Introduction to Data Processing and Information Systems 1	3
49.400			Human Relations in Organizations 1	3
86.362			Hospital Management for Medical Record Administrators*	3
86.358			Medical Record Computer Science*	3
86.306			Hospital Law and Ethics*	3
86.303	86.304		Foundations of Medical Science 1, 2*	6
86.301	86.302		Medical Terminology 1, 2*†	4
86.353	86.354		Organization of the Medical Record Department 1, 2*	6
86.370	86.371	86.372	Medical Record Science 1, 2, 3*	18
86.373	86.374		Medical Record Science 4, 5*	12
86.375	86.360	86.367	Applied Medical Record Science 1, 2, 3*	9
86.368			Topics in Health Records	3
86.325			Health Care Delivery	3

Elective Courses**18****Total Credits****178**

*In these designated professional courses, students must obtain a grade of C or better. Only one professional course may be repeated. Students who receive a grade of D in more than one will be asked to withdraw from the program.

†In cooperation with the Health Records Office of the College of Pharmacy and Allied Health Professions, a challenge examination for Medical Records majors may be available for 86.301 and 86.302 by contacting the University College Health Professions Program at 617-437-2819.

Health/Medical Record Administration Certificate Program (Major Code 862)

Candidates who wish to qualify for admission to the professional examination leading to registration as a Medical Record Administrator and who already hold a baccalaureate in another field of study from a college or university acceptable to Northeastern University may undertake the following course work. Graduates of approved schools in medical record administration are eligible for the national registration examination given by AMRA. Passing this examination gives professional recognition as a Registered Record Administrator (RRA). Successful completion of this course sequence with a cumulative point average of 2.5 will lead to certification from University College that the candidate has completed a professional program in Health Record Science. In addition to the required courses listed below, candidates must complete one year of a natural science, such as biology, chemistry, or microbiology, and a course in descriptive statistics. These requirements are in addition to the laboratory course in anatomy and physiology.

Candidates who wish to matriculate in this program must be interviewed by the Program Adviser. Arrangements for this interview may be

made through the Health Records Office, 205 Mugar Building. No candidate will be considered as matriculated until this requirement has been met.

Note: In addition to the required course work, proof of understanding of principles of descriptive statistics must be demonstrated. This requirement may be satisfied by successful completion of an approved statistics course at Northeastern or another university, or completion of University College course 39.311, Statistics 1, with a grade of C or better.

Courses Required for Professional Certification In the professional courses listed below, students must obtain a grade of C or better. Only one professional course may be repeated. Students who receive a grade of D in more than one professional course will be asked to withdraw from the program.

Students applying for the clinical sequence of courses (86.375, 86.360, 86.367) must have a quality point average of 2.5 and the approval of their assigned Health Record Program adviser.

Courses Required for Professional Certification

				quarter hours
18.424	18.425	18.426	Anatomy and Physiology 1, 2, 3	9
86.306			Hospital Law and Ethics	3
86.303	86.304		Foundations of Medical Science 1, 2	6
86.301	86.302		Medical Terminology 1, 2†	4
86.370	86.371	86.372	Medical Record Science 1, 2, 3	18
86.373	86.374		Medical Record Science 4, 5	12
86.353	86.354		Organization of the Medical Records Dept. 1, 2	6
86.362			Hospital Management for Medical Record Administrators	3
49.310			Information to Data Processing and Information Systems 1	3
86.358			Medical Record Computer Science	3
86.375	86.360	86.367	Applied Medical Record Science 1, 2, 3	9
86.325			Health Care Delivery	3
86.368			Topics in Health Records	3

Total Credits

82

†In cooperation with the Health Records Office of the College of Pharmacy and Allied Health Professions, a challenge examination for Medical Records majors may be available for 86.301 and 86.302 by contacting the University College Health Professions Program at 617-437-2819.

Medical Laboratory Science—Medical Technology

The Profession Medical Laboratory Science is concerned with laboratory examination of material necessary for proper monitoring of health and for the diagnosis and treatment of illness. Working in a variety of specialized fields such as microbiology, blood banking, hematology, clinical chemistry, or as generalists in all these areas, medical laboratory technicians and technologists are important health professionals.

The associate degree medical laboratory technician works under the direct supervision of a medical technologist and performs most of the common medical laboratory tests. The bachelor's degree medical technologist is considered qualified to perform, with little or no direct supervision, levels of laboratory tests from the simplest to the most complex. With additional education or experience, medical technologists can also function as educators, researchers, or supervisors. Medical technicians and technologists hold positions in hospital, private, and research laboratories. Some serve as sales and technical representatives for scientific supply and equipment companies; others serve in government positions.

Both the associate degree and bachelor's degree programs are conducted in affiliation with hospitals in the Boston area. The Baccalaureate degree is accredited by the Committee of Allied Health Education and Accreditation of the American Medical Association. Upon successful completion of one of these programs, the student receives either the Associate in Science or Bachelor of Science degree and is eligible to take a national certification examination given by either the National Certification Agency for Medical Laboratory Personnel or the Board of Registry of the American Society of Clinical Pathology.

The basic courses in medical laboratory science and basic science and general education courses are offered evenings, but the advanced medical laboratory science courses and the clinical experience are only offered full time during the day.

Prerequisite: Satisfactory completion of the Mathematics Placement Test or Introduction to Mathematics 1 and 2 (courses 10.681, 10.682).

Professional Requirements for the Associate Degree—Medical Laboratory Technician A clinical applied study program or appropriate substitute work experience is a required component of this degree. Work experience is acceptable if it meets the requirements for certification of either

the National Certification Agency for Medical Laboratory Personnel or the Board of Registry of the American Society of Clinical Pathologists. Students without appropriate work experience can apply for clinical applied studies through the University College MLS Clinical Coordinator in Room 206 Mugar.

Prerequisites for the clinical applied studies are a minimum of a 2.0 quality point average in required courses and a C– or better in each Medical Laboratory Science course (87. . . . courses.) These basic courses are available during the evening and are offered directly through the College of Pharmacy and Allied Health Professions. Students register as special students in the Basic College at Northeastern University. Tuition is the same as that charged for all Basic College MLS professional courses. These courses should be completed within three years of applying to the AD-MLT Clinical Applied Studies.

Students must apply to the Clinical Coordinator in the College of Pharmacy and Allied Health Professions (206 Mugar) for the six-month associate degree program in Medical Laboratory Technician Clinical Applied Studies one year in advance of the anticipated time of entry into the applied study courses. Students register as special students in the College of Pharmacy and Allied Health Professions. Tuition is at Basic College rates for Basic College courses.

Professional Requirements for the Bachelor of Science Degree Clinical applied study courses are available only full time during the day and are offered directly through the College of Pharmacy and Allied Health Professions. Students must apply for the applied study courses one year in advance of the anticipated time of entry into the applied study. A minimum of four quarters of full-time study is required for completion of the program requirements. During this time the student must meet all the requirements of the last four quarters of the undergraduate Basic College curriculum for the B.S. degree. Students register as special students in the Basic College. Tuition is the same as that charged for all Basic College medical laboratory science professional courses.

Prerequisites for the clinical applied study component include completion of each MLS course with a C– or better grade within five years of application to the applied study and completion of all other courses with an overall quality point average of 2.5 or higher.

**Medical Laboratory Science—Medical Laboratory Technician
(Major Code 800)**
Associate Degree
quarter hours

General				
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
86.333			Medical Care and Current Social Problems	3
86.306			Hospital Law and Ethics	3
10.607	10.608		College Algebra and Introduction to Calculus	8
Biology				
18.411	18.412	18.413	Biology 1, 2, 3	12
18.424	18.425	18.426	Human Anatomy and Physiology 1, 2, 3	9
Chemistry				
12.444	12.445	12.446	General Chemistry 1, 2, 3	9
12.427			Analytical Chemistry	4
MLS				
87.300			Medical Laboratory Science Orientation	2
*87.160			Basic MLS Urinalysis	2
*87.161			Basic Hematology 1	2
*87.102			Basic Hematology 2	2
*87.103			Basic Immunohematology	2
*87.104			Basic Clinical Microbiology	4
*87.105			Basic Clinical Chemistry	4
*87.113			Basic Clinical Immunology	3
Electives				
			Humanities	6
			Social Science	3
			Free	9
Total Credits				96

*Tuition for this course is at the Basic College tuition rate.

Medical Technology—Medical Technologist (Major Code 801)				Bachelor of Science
				quarter hours
Credits from Associate Degree in Medical Laboratory Technician Program				96
Biology				
18.457	18.458	18.459	Genetics 1, 2, and Lab	8
18.431	18.432	18.433	Cell Biology 1, 2, and Lab	8
18.421			Microbiology 1	3
Chemistry				
12.431	12.432	12.433	Organic Chemistry 1, 2, 3	12
Epidemiology				
87.313			Epidemiology 1	3
Physics				
11.604	11.605	11.606	General Physics 1, 2, 3	6
11.674			Physics Laboratory 2	2
Electives				
			Humanities	3
			Social Science	3
			Free	6
Strongly recommended electives are: psychology, computer course, statistics.				
Clinical Applied Study				
See explanation on page 118.				
*87.166			Applied Hematology	4
*87.167			Applied Immunohematology	3
*87.168			Applied Clinical Microbiology	7
*87.199			Applied Clinical Chemistry	7
*87.116			Medical Mycology	3
87.191			MLS Current Special Topics	1
87.204			Medical Parasitology	2
87.221			MLS Management	2
87.224	87.234	87.244	Clinical Microbiology 2, 3, 4	6
87.225	87.235	87.245	Clinical Chemistry 2, 3, 4	6
87.226			MLS Education	2
87.232	87.242		Hematology 3, 4	5
87.253			Immunohematology	2
87.280			MLS Special Topics	2
87.281			MLS Senior Seminar	2
Total Credits				204

* Tuition for this course is at the Basic College tuition rate.

Medical Laboratory Science—Hematology**Bachelor of Science Degree**

The Profession Hematology is a specialty within medical laboratory science. Hematology technologists may be employed in hospitals and clinical laboratories, where they perform specific laboratory tests that aid in the diagnosis, treatment, and follow-up of infections, anemias, leukemias, and bleeding disorders. The modern hematology laboratory is usually well equipped with electronic instruments which the technologist must operate and maintain. Additional responsibilities may include laboratory quality control and associated problem solving.

The requirements for categorical certification in hematology are indicated by the Board of Registry of the American Society of Clinical Pathologists.

Students should contact the American Society of Clinical Pathologists, Board of Registry, P.O.

Box 96215, Chicago, Illinois 60693 for details concerning eligibility to write the hematology examination.

The curriculum in hematology does not incorporate a clinical or applied study component but is primarily designed for those who work in this field. It gives them the opportunity to earn a baccalaureate degree with a concentration in this particular area of clinical laboratory science.

The Medical Laboratory Science professional courses, numbered in the 87.100 and 87.200 series, will be offered directly through the College of Pharmacy and Allied Health Professions. Students must register as special students of the Basic College. Tuition is the same as that charged for all Basic College Medical Laboratory Science professional courses. A grade of C– or better is required in the professional courses.

Hematology (Major Code 807)**Bachelor of Science Degree****quarter hours****Biology**

18.411	18.412	18.413	Biology 1, 2, 3	12
18.424	18.425	18.426	Human Anatomy and Physiology	9
18.421			Microbiology 1	3
18.457	18.458	18.459	Genetics 1, 2, and Lab	8
18.431	18.432	18.433	Cell Biology 1, 2 and Lab	8

Math

10.607	10.608		College Algebra and Introduction to Calculus	8
--------	--------	--	--	---

Chemistry

12.444	12.445	12.446	General Chemistry 1, 2, 3	9
12.427			Analytical Chemistry (Summer Intensive)	4
or			or	or
12.421	12.422	12.423	Analytical Chemistry 1, 2, 3	9
12.431	12.432	12.433	Organic Chemistry 1, 2, 3	12

Physics

11.604	11.605	11.606	General Physics 1, 2, 3	6
11.674			Physics Laboratory 2	2

English

30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation.)	9
--------	--------	--------	--	---

Medical Laboratory Science

87.300		MLS Orientation (to be taken if not working in the field)	2
*87.160		Basic Urinalysis	2
*87.161		Basic Hematology 1	2
*87.102		Basic Hematology 2	2
*87.104		Basic Clinical Microbiology	4
*87.103		Basic Immunohematology	2
*87.105		Basic Clinical Chemistry	4
*87.113		Basic Clinical Immunology	3
*87.190		Undergraduate Research	2
*87.204		Parasitology (offered days only)	2
*87.211		Coagulation	2
*87.213		Immunohematology	2
*87.222		Histochemistry	2
87.311	87.312	Morphologic Hematology 1, 2	6
86.330	86.331	Health Science Education 1, 2	6
87.301		Quality Control	3

Health Related

86.306		Hospital Law and Ethics	3
86.333	86.334	Medical Care and Current Social Problems	6
86.307	86.308	Hospital Organization and Management 1, 2	6

Electives

Humanities	9
Social Science	9
Free electives	18

Strongly recommended electives are: histology, psychology, economics, sociology, statistics, hematology, computer course, epidemiology.

Total credits **187**

*Tuition for this course is at the Basic College tuition rate.

Medical Laboratory Science—Cytotechnology**Certificate Program**

The Profession Cytotechnology is a specialty in the broader field of medical laboratory science. Cytotechnologists are normally employed in pathology laboratories, where they expertly examine slides of cells for minute abnormalities that are the early warning signs of cancer and related diseases. Cytotechnology occupies an important place in clinical medicine, requiring a technologist with specialized laboratory training and a sound academic background.

The clinical program, offered through University College and conducted in affiliation with several hospitals composing the Boston School of Cytotechnology, is offered only full time during the day and leads to a certificate which is awarded by University College. Completion of the program qualifies a student for admission to the professional examination conducted by the Board of Registry of the American Society of Clinical Pathologists.

The program begins in September. Students planning to apply are advised to consult the

Health Professions Programs Office prior to the preceding Winter quarter.

Eligibility All applicants must meet the prerequisites for admission as established by the Council on Medical Education of the American Medical Association and the Cytotechnology Programs Review Committee of the American Society of Cytology.

As of September 1980, applicants should have a baccalaureate degree or a minimum of three years of academic preparation from an accredited college or university. Course work must include a minimum of 14 semester hours or 21 quarter hours of biological sciences.

All international applicants must submit TOEFL (Testing of English as a Foreign Language) scores along with their application material. Information regarding the test is available by writing to P.O. Box 899, Princeton, New Jersey, 80540 U.S.A.

Medical Laboratory Science—Cytotechnology**Certificate Program****quarter hours**

This is a 12-month, full-time day certificate program. A special tuition rate applies to the following courses:

87.508			Introduction to Cytotechnology	2
87.528	87.538	87.558	Cytopathology 1, 2, 3	6
87.568			Cytogenetics and New Concepts	2
87.598			Special Topics	2
87.608			Seminar: Cytopathology Criteria and Correlations	2
87.518	87.548	87.578	Applied Cytology 1, 2, 3	12
87.618			Applied Cytology 4	2

Total Credits

28

Radiologic Technology

The program in Radiologic Technology is a joint offering of the University and several area hospitals. The classroom experiences are provided by the University, and the Laboratory Practicum is conducted at an assigned affiliated hospital. The Program is accredited by the Council on Medical Education of the American Medical Association.

The Radiologic Technologist is a respected member of the allied health team in the diagnostic and therapeutic environment of the clinic or hospital, and an important functionary in the production, quality control, and inspection laboratories of the industrial community. Medically related responsibilities demand effective rapport with internists, surgeons, pathologists, nurses, and laboratory personnel, while industrial competency requires close association with metallurgists, production and manufacturing specialists, engineers, and scientists.

Prerequisite: Candidates must have satisfactorily passed at the high school level three years of math (Algebra 1, Algebra 2, and geometry), one year of biology, and one year of an additional science (chemistry or physics). All applicants

must satisfactorily complete the Scholastic Aptitude Test (SAT) and submit one letter of recommendation from a science instructor. In addition, applicants must satisfy general University requirements and complete the University's Mathematics Placement Test satisfactorily. Candidates successfully meeting the above requirements will be scheduled for an interview with the Radiologic Technology Program Directors.

Associate Degree Program This program (28 months) is a full-time day division of University College.

All graduates are eligible to sit for examination for certification by the American Registry of Radiologic Technologists.

Part-time Associate Degree Evening Program Candidates who wish to qualify for admission to University College for the part-time Associate Degree Program in Radiologic Technology must be certified by the American Registry of Radiologic Technology.

Completion of the courses listed under **Part-time Evening Program** is required for the Associate in Science Degree.

Radiologic Technology (Major Code 806)

Associate in Science Degree

quarter hours

First Year

Quarter 1		
10.627	Mathematics 1	3
18.570	Gross Anatomy and General Physiology A	3
18.670	Anatomy and Physiology Lab A	1
30.305	English 1	3
86.420	Radiologic Technology Orientation 1	3
86.422	Radiologic Science 1	4

Quarter 2		
18.571	Gross Anatomy and General Physiology B	3
18.671	Anatomy and Physiology Lab B	1
30.306	English 2	3
86.424	Principles of Radiology 1	4
86.426	Radiologic Photography and Exposure 1	4
86.423	Radiologic Science 2	4

Quarter 3		
86.648	Radiologic Clinical Practicum 1—Full Time at Hospitals	3

Quarter 4		
10.628	Mathematics 2	3
18.411	Biology 1 with Laboratory	4
86.427	Radiologic Photography and Exposure 2	4
86.425	Principles of Radiology 2	4
86.421	Radiologic Technology Orientation 2	3

Second Year*Quarter 1*

86.649	Radiologic Clinical Practicum 2—Full Time at Hospitals	3
--------	--	---

Quarter 2

86.650	Radiologic Clinical Practicum 3—Full Time at Hospitals	3
--------	--	---

Quarter 3

18.412	Biology 2 with Laboratory	4
19.301	Introduction to Psychology: Fundamental Issues	3
19.302	Introduction to Psychology: Developmental Aspects	3
30.307	English 3 (required prior to matriculation)	3
86.434	Advanced Radiologic Technology 1	3
86.629	Radiation Protection & Radiobiology†	3

Quarter 4

86.651	Radiologic Clinical Practicum 4—Full Time at Hospitals	3
--------	--	---

Third Year*Quarter 1*

18.413	Biology 3 with Laboratory	4
45.305	Introduction to Business and Management Intensive	6
86.435	Advanced Radiologic Technology 2†	3
86.628	Imaging Modalities†	3

Final Quarter Full time at hospitals until mid-January.

Total Credits**101****Part-Time Association Degree Evening Program*****Associate in Science Degree**

				quarter hours
10.627	10.628		Mathematics 1, 2	6
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
18.411	18.412	18.413	Biology 1, 2, 3	12
45.301	45.302		Introduction to Business and Management 1, 2	6
21.301			Introduction to Sociology: Fundamental Issues	3
21.302			Introduction to Sociology: The Individual and Social Roles	3
or			or	
19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
86.434	86.435		Advanced Radiologic Technology 1†, 2†	6
86.628			Imaging Modalities†	3
86.629			Radiation Protection and Radiobiology†	3

Total Credits**101**

* Prerequisite: Satisfactory completion of a certificate program in Radiologic Technology or registration by the American Registry of Radiologic Technologists.

† Courses will be scheduled for late afternoons for certificate students desiring to continue for the A.S. Degree.

Therapeutic Recreation Services

Therapeutic Recreation, which is concerned with the revitalization of the mind, spirit, and skills of people in rehabilitation facilities, community settings, nursing homes, and hospitals, has emerged as an important part of the team concept in human services.

The certificate represents that the criteria set by the program's consultant have been met and that a basic level of competence to contribute to this field has been attained. At present there is no official state licensing board for Therapeutic Recreation practitioners to give the certificate public standing; it is recognized, however, by the Massachusetts Recreation and Park Association in its professional registration plan.

The certificate and associate degree program in University College include individual case studies, group dynamics, and motivational techniques, as well as field practicum experiences.

The associate degree program in therapeutic recreation has been designed to accommodate students who elect to pursue a B.S. degree in health management or sociology.

Curriculum	quarter hours
I. Certification—38 quarter hours	
Required professional courses	18
Required practicum	8
Required skill electives	6
Required professional electives	6
II. Associate Degree—97 quarter hours	
Required professional courses	18
Required practicum	8
Required professional electives	24
Required core courses	47

The professional courses in the Therapeutic Recreation curriculum (63.—) are generally offered only at the Boston Campus with the exception of 63.330, 63.304, 63.305, 63.306, 63.323, 63.324, and 63.325.

Therapeutic Recreation Services (Major Code 601)	Activity Leader Certificate Program
---	--

	quarter hours
--	----------------------

Required

30.305	English 1	3
--------	-----------	---

Professional Courses—Required

63.301	63.302	63.303	Principles and Practices of Therapeutic Recreation 1, 2, 3	9
63.304	63.305		Group Dynamics and Leadership 1, 2	6
63.315	63.311		Field Practicum in Therapeutic Recreation 1, 2*	8
or			or	or
63.315	63.316		Independent Study†	8

* See course description for practicum prerequisites. The appropriateness of being given a practicum assignment will be determined by the Program Consultant or Coordinator. Petitions may be obtained in 102 Churchill Hall.

† Permission is required for this option.

Skill Electives

Select 6 q.h. from the following:

63.321	Social Recreation	3	
63.322	Music Therapy	3	
63.323	63.324	Arts and Crafts 1, 2	6
63.326		Media Resources and Techniques	3
63.327		Therapeutic Use of Dramatics	3

Professional Electives

Select 6 q.h. from the following:

63.330	The Process of Aging	3
63.331	The Nursing Home Experience	3
63.332	Therapeutic Recreation in Rehabilitation	3
63.334	Camping for the Disabled	3
63.336	Mental Illness and Retardation	3
63.337	Therapeutic Recreation in Child Development	3
63.340	Leisure Counseling	3
63.341	Humanistic Approaches to Recreational Therapy	3
63.343	Community Recreation for the Handicapped	3

Total Credits	38
----------------------	-----------

Recommended Course Sequence for Certificate Program

Beginning Courses

30.305	English 1	
63.301	63.302	63.303
		Principles and Practices of Therapeutic Recreation
		1, 2, 3
63.304	63.305	Group Dynamics 1, 2

May be taken after completing 30.305 and 63.301:

63.321	63.322	63.323	Social Recreation, Music Therapy, Arts and Crafts 1	
63.324	63.326	63.327	Arts and Crafts 2, Media Resources and Techniques, Therapeutic Use of Dramatics	
63.330	63.331	63.336	Process of Aging, Nursing Home Experience, Mental Illness and Retardation	

Advanced Courses

63.332		Therapeutic Recreation in Rehabilitation
63.334		Camping for the Disabled
63.337		Therapeutic Recreation in Child Development
63.340		Leisure Counseling
63.341		Humanistic Approach to Recreational Therapy
63.343		Community Recreation for the Handicapped
63.310	63.311	Field Practicum 1, 2
63.315	63.316	Independent Study 1, 2

Therapeutic Recreation Services (Major Code 600)	Associate in Science Degree
--	-----------------------------

				quarter hours
Required Professional Courses				
63.301	63.302	63.303	Principles and Practices of Therapeutic Recreation 1, 2, 3	9
63.304	63.305		Group Dynamics and Leadership 1, 2	6
63.335			Activity and Movement Analysis	3
63.310	63.311		Field Practicum in Therapeutic Recreation 1, 2*	8
or			or	or
63.315	63.316		Independent Study†	8

* See course description for practicum prerequisites. The appropriateness of being given a practicum assignment will be determined by the academic adviser.
Petitions may be obtained in 102 Churchill Hall.

†Permission is required for this option.

Skill and Professional Electives

Select 24 quarter hours from skill electives listings and professional electives listings in certificate program.	24
---	----

Required Core Courses

19.301			Introduction to Psychology: Fundamental Issues	3
19.302			Introduction to Psychology: Developmental Aspects	3
19.303			Introduction to Psychology: Personal Dynamics	3
18.411	18.412		Biology 1, 2	8
18.424	18.425	18.426	Anatomy and Physiology 1, 2, 3	9
21.363			Social Gerontology	3
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)	9
86.300			Medical Terminology Survey	3
86.303	86.304		Foundations of Medical Science 1, 2	6

Total Credits	97
---------------	----

Recommended Course Sequence for Associate in Science Degree

Beginning Courses

18.411	18.412		Biology 1, 2
30.305	30.306	30.307	English 1, 2, 3 (required prior to matriculation)
63.301	63.302	63.303	Principles and Practices of Therapeutic Recreation 1, 2, 3
63.304	63.305		Group Dynamics 1, 2

May be taken after completing prerequisite courses 30.305 and 63.301:

63.321	63.322		Social Recreation, Music Therapy
63.323	63.324	63.325	Arts and Crafts 1, 2; Arts and Crafts (Intensive)
63.326	63.327		Media Resources and Techniques; Therapeutic Use of Dramatics
63.330	63.331	63.336	Process of Aging, Nursing Home Experience, Mental Illness and Retardation

Advanced Courses

18.424	18.425	18.426	Anatomy and Physiology 1, 2, 3
19.301			Introduction to Psychology: Fundamental Issues
19.302			Introduction to Psychology: Developmental Aspects
19.303			Introduction to Psychology: Personal Dynamics
21.363			Social Gerontology
63.310	63.311		Field Practicum 1, 2
63.315	63.316		Independent Study 1, 2
63.332			Therapeutic Recreation in Rehabilitation
63.334			Camping for the Disabled
63.337			Therapeutic Recreation in Child Development
63.340			Leisure Counseling
63.341			Humanistic Approach to Recreational Therapy
63.343			Community Recreation for the Handicapped

May be taken after completing prerequisite course 18.424:

63.335			Activity and Movement Analysis
86.300			Medical Terminology Survey
86.303	86.304		Foundations of Medical Science 1, 2

Dental Assistant Program

Northeastern University offers the Dental Assistant Program in collaboration with Tufts University School of Dental Medicine and other local clinical facilities. The program consists of thirty-seven weeks of full-time day instruction, with both lectures and laboratory sessions conducted at Northeastern University.

Accredited by the Commission of Accreditation of Dental and Dental Auxiliary Education Programs, the program helps students prepare for the certification examination conducted by the Dental Assisting National Board.

Students who successfully complete the program and pass the certification examination may petition for academic credit to be applied toward

the Bachelor of Science degree program in Health Science offered by University College. Credits may also be applied toward the Bachelor of Health Education degree program offered by Northeastern's Boston-Bouvé College of Human Development Professions.

To receive detailed information and an application form, please contact:
Ms. Eleanor A. King, Director
Dental Assistant Program
Room 244, Forsyth Building
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115

Certificate Programs

Many persons who enroll in University College are seeking specific, job-related skills rather than the traditional course sequence of a degree program. To help meet such educational needs, University College offers a variety of certificate programs in business, arts and sciences, and law enforcement.

Certificate programs in University College are designed for:

- students planning to complete an associate degree but who first want to acquire the marketable skills offered in certificate programs
- individuals seeking an intensive course of study in a discipline but who do not wish to acquire a degree
- individuals already holding a degree but who wish to acquire a specialized body of knowledge for career change or professional development

All certificate programs, except American Sign Language, are designed so that transfer into a related degree program is possible. In addition, up to twelve quarter hours of relevant transfer credit from another academic institution or program may be applied toward fulfilling the requirements for a certificate. To be applied, these transfer credits must reflect academic work that was completed within five years to the date on which the student completes all of the requirements for a particular certificate.

Upon completion of a certificate program, students must submit a petition requesting a certificate. Petitions are available in 102 Churchill Hall or at the administrative offices at our off-campus locations. For further information concerning a particular certificate program, please call the telephone number listed with that program.

Arts and Sciences

Advertising and Public Relations

Certificate Program

		quarter hours
27.421	Design and Production of Promotional Publications	3
27.427	Advertising Design	3
37.307	Business and Professional Speaking	3
38.304	Fundamentals of Newswriting	3
38.325	Advertising Basics	3
38.330	Public Relations Basics	3
38.331	Public Relations Practices	3
38.332	Public Relations Problems	3
43.301	Introduction to Marketing 1	3

Total Credits

27

For further information, call 617-437-2423.

American Sign Language			Certificate Program
			quarter hours
36.401	36.402	American Sign Language 1, 2	6
36.403	36.404	Intermediate American Sign Language 1, 2	6
36.405		Linguistics of American Sign Language	3
36.406		American Deaf Culture	3
36.407	36.408	Sign Language Interpreting 1, 2	6
Total Credits			24

All credits must be completed in residence.

For further information, call 617-437-2423.

Graphic Design and Communication			Certificate Program
			quarter hours
27.420		Graphic Communication and Production	3
27.421		Design and Production of Promotional Publications	3
27.422		Design and Production of Technical Publications	3
27.425	27.426	Graphic Design 1, 2 (formerly 27.371 Basic Commercial Design and 27.372 Commercial Design Practice)	6
27.427		Advertising Design (formerly Commercial Design Problems)	3
27.428		Advanced Graphic Design	3
30.430		The Business and Technical Presentation	3
38.325		Advertising Basics	3
Total Credits			27

For further information, call 617-437-2423.

Professional Writing			Certificate Program
			quarter hours
30.308	30.309	Expository and Persuasive Writing 1, 2	6
30.310		Expository Communications	3
30.410	30.411	Technical Writing 1, 2	6
30.319		Creative Writing Workshop	3
30.326		Book Publishing	3
38.304		Fundamentals of Newswriting	3
38.305		Newsgathering and Reporting	3
Total Credits			27

For further information, call 617-437-2423.

Software Technical Writing			Certificate Program
			quarter hours
27.420		Graphic Communication and Production	3
30.410	30.411	Technical Writing 1, 2	6
30.413		Editing for Science and Technology	3
30.425	30.426	Computer Software Technical Writing 1, 2	6
49.310	49.311	Introduction to Data Processing and Information Systems 1, 2 (formerly Electronic Data Processing 1, 2)	6

Choose one computer language from the following:

49.320	Introduction to Programming in COBOL	3
49.327	FORTTRAN Programming 1	3
49.335	Introduction to Programming in BASIC	3
49.343	PASCAL Programming 1	3

Total Credits 27

For further information, call 617-437-2423.

Speech Communication Certificate Program

				quarter hours
37.301	37.302	37.303	Effective Communication 1, 2, 3	9
37.304			Voice and Articulation 1	3
37.307			Business and Professional Speaking	3
37.308			Argumentation and Discussion	3
37.333			Self-Concept and Communication	3
37.334			Listening	3
37.335			Interviewing	3

Total Credits 27

For further information, call 617-437-2423.

Business Administration

Accounting Certificate Program

				quarter hours
41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
41.401	41.402	41.403	Intermediate Accounting 1, 2, 3	9
41.405			Cost Accounting 1	3
44.301			Principles of Finance	3

Total Credits 24

For further information, call 617-437-2418.

Computer Programming and Systems Analysis Certificate Program

				quarter hours
49.310	49.311		Introduction to Data Processing and Information Systems 1, 2 (formerly Electronic Data Processing 1, 2)	6
49.321	49.322	49.323	COBOL Programming 1, 2, 3	9
49.340	49.342		Programming in BASIC 1, 2	6
49.360	49.361	49.362	Systems Analysis and Design 1, 2, 3	9

Total Credits 30

This certificate differs from the Computer Systems Specialist Program (see page 139) in that the courses in this Certificate are offered at all campuses at regularly scheduled times and may be completed over a longer period of time than in the Specialist Program.

For further information, call 617-437-2418.

Finance			Certificate Program	
			quarter hours	
41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
44.301			Principles of Finance	3
44.310	44.311		Financial Management 1, 2	6
44.312			Investment Principles	3

Total Credits **21**

For further information, call 617-437-2418.

Hotel and Restaurant Management			Certificate Program	
			quarter hours	
41.301	41.302		Accounting Principles 1, 2	6
47.400			Introduction to Hotel and Restaurant Management	3
47.406			Front Office Management	3
47.410	47.411		Food Preparation 1, 2	6
47.423			Managerial Accounting for the Hospitality Industry	3

Total Credits **21**

For further information, call 617-437-2418.

Human Resource Management			Certificate Program	
			quarter hours	
49.440			Organizational Behavior*	3
49.441			Introduction to Human Resource Management*	3
49.442			Applied Human Resource Management*	3
49.404	49.405		Personnel Management 1, 2	6
49.429			Public Sector Collective Bargaining in the U.S.	3
or			or	
49.430			Private Sector Collective Bargaining in the U.S.	3
49.432	49.433		Employment Rights 1, 2	6

Total Credits **24**

*49.440 Organizational Behavior substitutes for 49.400 Human Relations 1; 49.441 Introduction to Human Resource Management substitutes for 49.401 Human Relations 2 and 49.420 Labor Management Relations 1; 49.442 Applied Human Resource Management substitutes for 49.421 Labor Management Relations 2.

For further information, call 617-437-2418.

Marketing			Certificate Program	
			quarter hours	
43.301	43.302		Introduction to Marketing 1, 2	6
43.310	43.311		Advertising and Sales Promotion Management 1, 2	6
43.322	43.323		Sales Management 1, 2	6
43.334	43.335		Marketing Management 1, 2	6

Total Credits **24**

For further information, call 617-437-2418.

Purchasing			Certificate Program	
				quarter hours
41.301	41.302	41.303	Accounting Principles 1, 2, 3	9
45.301			Introduction to Business and Management 1 (formerly Management and Organization 1)	3
45.410			Production Control and Inventory Management 1	3
45.451	45.452		Purchasing 1, 2	6
45.457			The Art and Technique of Negotiation in Business	3
45.458			Materials Requirement Planning	3
Total Credits				27

For further information, call 617-437-2418.

Transportation and Physical Distribution Management			Certificate Program	
				quarter hours
45.301			Introduction to Business and Management 1 (formerly Management and Organization 1)	3
48.301			Elements of Transportation	3
48.302			Physical Distribution Management	3
48.305			Traffic Management 1	3
48.316			Carrier Management	3
48.321			Transportation Regulation 1	3
Total Credits				18

For further information, call 617-437-2418.

Law Enforcement

Law Enforcement			Certificate Program	
				quarter hours
94.304	94.305		Criminal Investigation and Case Preparation 1, 2	6
94.308	94.309		Interviews and Interrogations 1, 2	6
94.387	94.388		Administration of Justice 1, 2	6
94.415			Domestic Violence	3
94.389	94.390		Civil Law in Criminal Justice 1, 2	6
94.381	94.382		Civil Liberties and the Police 1, 2	6
Total Credits				33

For further information, call 617-437-3324.

Correctional Practices			Certificate Program
			quarter hours
94.301		Human Rights in Corrections	3
94.303		Correctional Counseling	3
94.330	94.331	Treatment of Offenders 1, 2	6
94.332	94.333	Correctional Administration 1, 2	6
94.341	94.342	Probation and Parole Practices 1, 2	6
94.345	94.346	Juvenile Corrections	6
Total Credits			30

For further information, call 617-437-3324.

Criminal Justice			Certificate Program
			quarter hours
94.338	94.339	Criminology 1, 2	6
94.387	94.388	Administration of Justice 1, 2	6
94.328	94.329	Social Deviance 1, 2	6
94.365		Seminar in L.E.—Victimology	3
94.377		Seminar in L.E.—Criminal Behavior	3
94.371	94.372	Man, Law, and Society 1, 2	6
Total Credits			30

For further information, call 617-437-3324.

Social Problems and Law Enforcement			Certificate Program
			quarter hours
94.337		Police Work with Juveniles	3
94.340		Delinquency Prevention	3
94.399		Alcohol Problems in Law Enforcement	3
94.415		Domestic Violence	3
94.385		Seminar in L.E.—Mental Health and the Police	3
94.376		Seminar in L.E.—Minorities and the Urban Crisis	3
94.364		Seminar in L.E.—Youth Crime Control	3
94.322		Research Methods in Criminal Justice	3
94.383		Seminar in L.E.—Drug Abuse	3
94.405		Hazardous Materials	3
Total Credits			30

For further information, call 617-437-3324.

Legal Concepts in Law Enforcement			Certificate Program
			quarter hours
94.391	94.392	Criminal Law 1, 2	6
94.393	94.394	Evidence and Court Procedure 1, 2	6
94.389	94.390	Civil Law in Criminal Justice 1, 2	6
94.371	94.372	Man, Law, and Society 1, 2	6
94.316		The Law and Institutional Treatment	3
94.398		Massachusetts Criminal Law	3
Total Credits			30

For further information, call 617-437-3324.

Law Enforcement Administration**Certificate Program**

			quarter hours
94.343	94.344	Law Enforcement Management and Planning 1, 2	6
94.387	94.388	Administration of Justice 1, 2	6
94.336		Police Supervision	3
94.384		Seminar in Law Enforcement–Executive Development	3
94.397		Law Enforcement Fiscal Management	3
94.386		Seminar in Law Enforcement–Data Processing	3
94.306		Comparative Police Systems	3
94.370		Seminar in Law Enforcement–Collective Bargaining	3

Total Credits**30**

For further information, call 617-437-3324.

Loss Prevention and Security Administration**Certificate Program**

			quarter hours
94.406		Legal Aspects of Security Operations	3
94.352	94.353	Physical Security 1, 2	6
94.403	94.404	Security Administration 1, 2	6
94.307		Introduction to Industrial Security	3
94.351		Industrial Fire Prevention	3
94.395	94.396	Fire Investigation and Arson 1, 2	6
94.405		Hazardous Materials	3
94.354		Retail Security	3
94.359		Hospital Security	3

Total Credits**36**

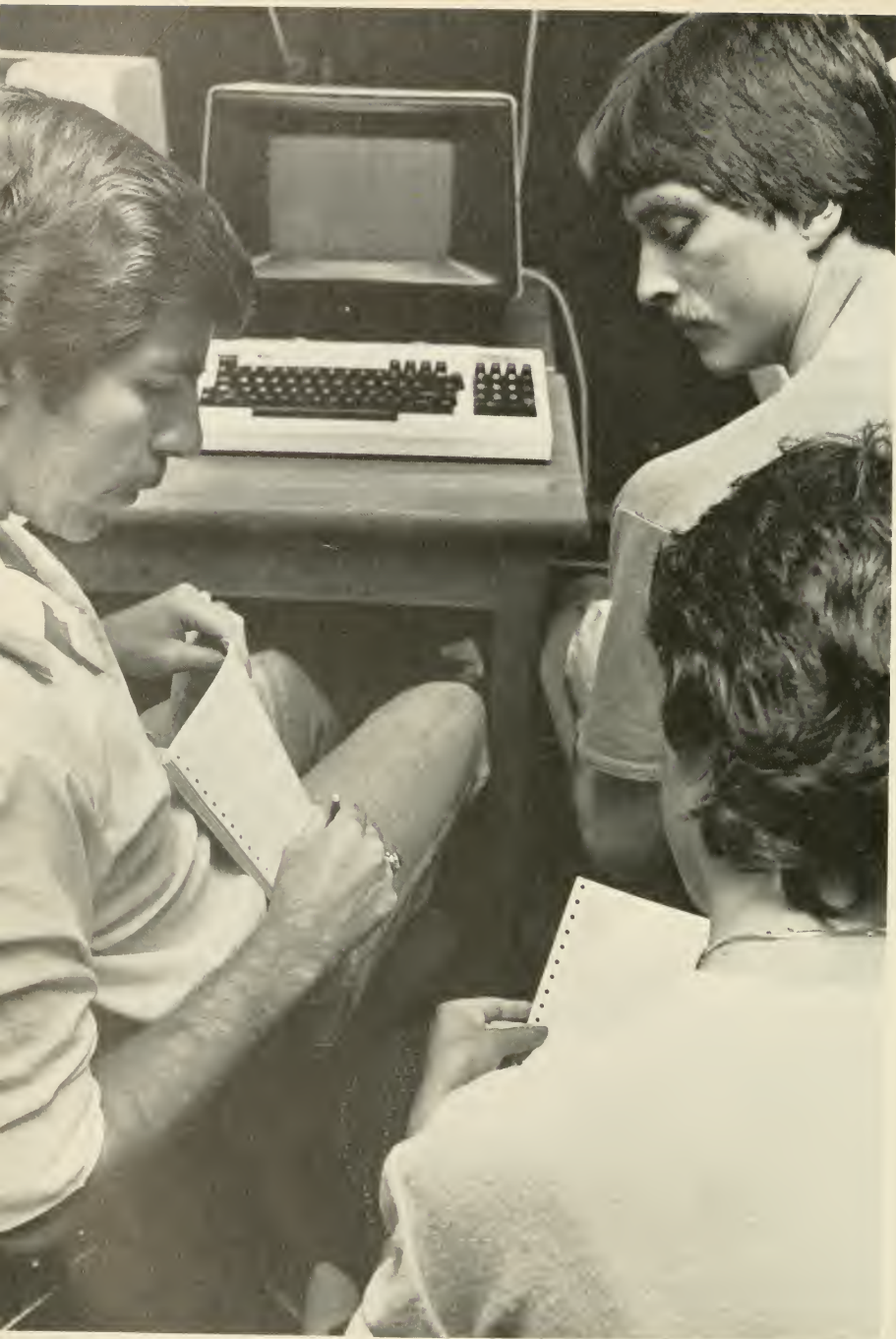
For further information, call 617-437-3324.

Law, Policy, and Society**Certificate Program**

				quarter hours
94.410	94.411	94.412	Logical and Ethical Foundations of Decision Making 1, 2, 3	9
94.387	94.388		Administration of Justice 1, 2	6
94.371	94.372		Man, Law, and Society 1, 2	6
94.308	94.309		Interviews and Interrogations 1, 2	6
94.316			The Law and Institutional Treatment	3

Total Credits**30**

For further information, call 617-437-3324.



Computer Systems Specialist Program

The Program

The Computer Systems Specialist Program is designed to offer students an opportunity to acquire training as computer systems specialists. Intended for students who are interested in entry-level programming positions in business and industry, the program is structured to help meet the career goals of individuals who presently have minimal or no academic or work-related background in computer programming.

Admission College Board Examinations are not required for admission. For purposes of evaluation for admission, however, a computer-programmer aptitude test will be administered to applicants who successfully complete the initial screening process. Enrollment is limited. Further, the decision to offer this program is contingent upon a sufficient number of qualified candidates.

Days, Dates, Times, and Places The program is scheduled twice during the academic year, in October and April. Classes are scheduled for thirty weekends: on Fridays, from 6:00 to 10:00 p.m., and all day Saturdays, from 9:00 a.m. to 5:00 p.m. All classes will be held at the Northeastern Campus in Burlington, Massachusetts.

Course Content Course content includes the following:

			quarter hours
45.301	45.302	Introduction to Business and Management 1, 2	6
49.310	49.311	Introduction to Data Processing and Information Systems 1, 2	6
49.344	49.345	COBOL Programming A and B	12
49.336		Data Base Systems	3
49.340	49.342	Programming in BASIC 1, 2	6
49.360	49.361	49.362 Systems Analysis and Design 1, 2, 3	9
49.363		Systems Analysis and Design 4	3
Total Credits			45

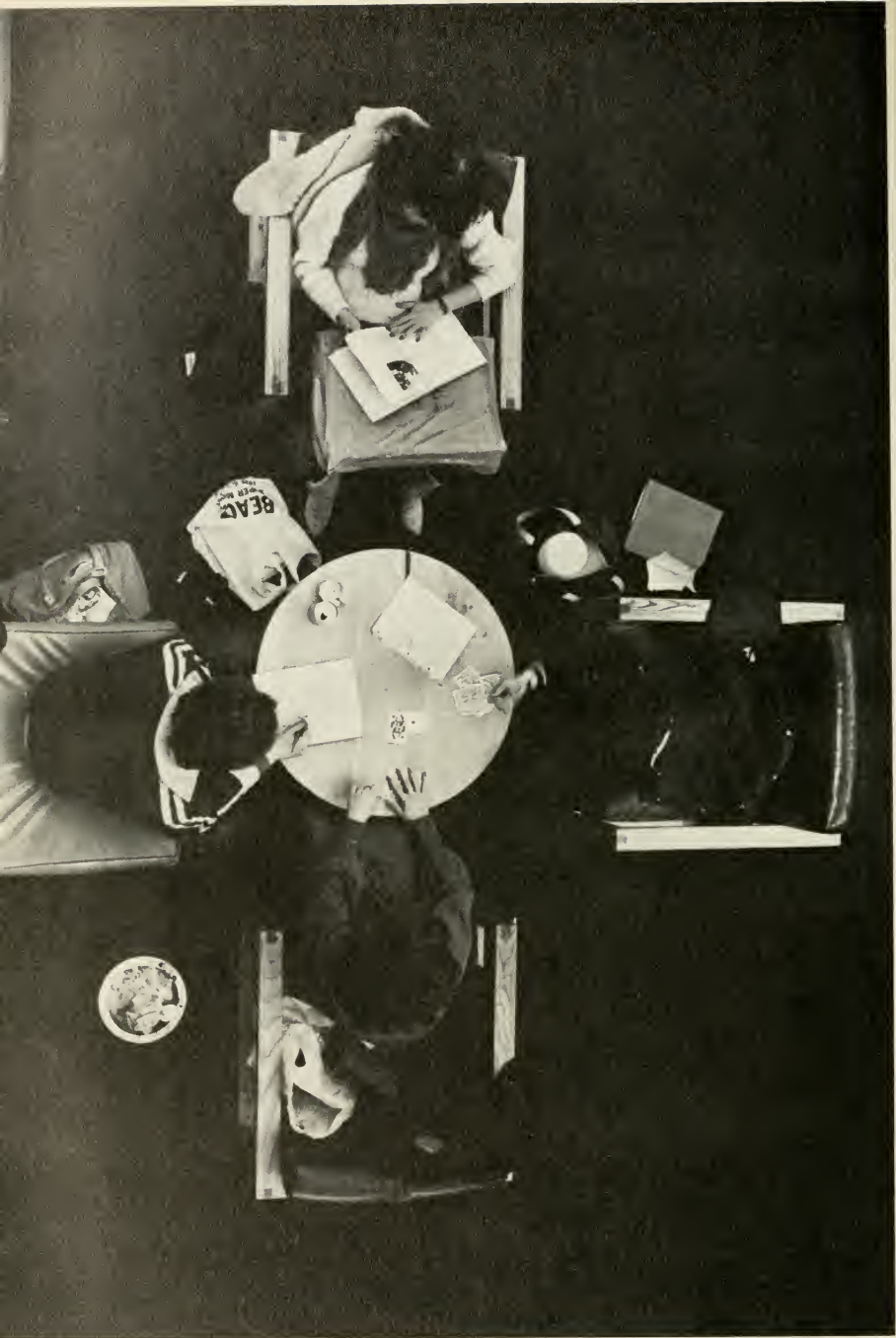
Academic Credit and Certification Upon satisfactory completion of the program, students will have accumulated forty-five quarter hours of academic credit. These credits represent 26 percent of the credits necessary for a bachelor's degree. Students satisfactorily completing the program will also receive a certificate in programming.

Placement Assistance

Although job placement is not guaranteed, most students who successfully complete the program find suitable employment. Specific placement services include individual counseling; job-search seminars on career opportunities, self-assessment, job search, résumé preparation, and interviewing skills; and résumé referrals to employers.

Application Form and Further Information

For further information about the program and program costs and an application form, contact Richard J. Comings, Assistant Dean and Director of Special Programs, Northeastern University, University College, 102 Churchill Hall, 360 Huntington Avenue, Boston, Massachusetts 02115, telephone 617-437-2407.



Course Descriptions

Not all the courses listed in this bulletin will be offered. A final list of courses to be offered will be contained in the University College Schedule of Courses, which gives the hours, days, and location of classes. This schedule is issued prior to the Fall, Winter, Spring, and Summer Quarters.

Courses marked with an asterisk (*) indicates title and/or number change. Students who have taken the course under its former designation should not enroll.

Abbreviations

q.h.: quarter hours (credit earned)

cl.: hours required in class per week

Prereq.: Prerequisite

10: Mathematics (University College)

10.627 Mathematics 1 (3 q.h.)

The real number system, exponents, polynomials, factoring, radicals, algebraic fractions, complex fractions, linear equations, word problems. *Note: a placement test will be given during the first class meeting. Students obtaining an unsatisfactory score on this test will be advised to enroll in 10.691 for additional preparation before attempting this course.*

10.628 Mathematics 2 (3 q.h.)

Linear inequalities, letter equations, quadratic equations, and related problems. Graphs and functions, systems of equations. *Prereq. 10.627.*

10.629 Mathematics 3 (3 q.h.)

Exponential and logarithmic functions, sequences, and series. Introduction to calculus. *Prereq. 10.628.*

10.632 Mathematics for Business Management 1 (3 q.h.)

Topics of mathematics applicable to business management. Linear equations and inequalities, matrix algebra, linear programming, sets, and counting techniques. *Prereq. 10.629 or equiv.*

10.633 Mathematics for Business Management 2 (3 q.h.)

Business applications of probability, decision theory, markov chains, game theory, and competitive analysis. *Prereq. 10.632.*

10.634 Mathematics for Business Management 3 (3 q.h.)

Topics in statistics, mathematics of finance, communication models using directed graphs, logic. *Prereq. 10.633.*

10.635 Mathematics for Business Management (Intensive) (6 q.h.)

A combination of 10.632 and 10.633.

10.640 Calculus for Nonengineers 1 (3 q.h.)

An introductory calculus course for students in arts and sciences, business administration, and other nonengineering curricula. Fundamentals of differential calculus, rules of differentiation, rates of change, graph sketching, growth and decay functions. *Prereq. 10.629 or equiv.*

10.641 Calculus for Nonengineers 2 (3 q.h.)

Applications of differential calculus, including problems in optimization, velocity and acceleration, compound interest, population growth, and fitting equations to data. Introduction to integral calculus, areas, average values of functions, marginal cost and profit, depreciation. *Prereq. 10.640.*

10.642 Calculus for Nonengineers 3 (3 q.h.)

Calculus of trigonometric functions, techniques of integration, numerical methods, differential equations. Applications include pricing, allocation of funds, present value of an investment, manufacturing efficiency, and product reliability. *Prereq. 10.641.*

10.651 Mathematics (Intensive) (9 q.h.)

A combination of 10.627, 10.628, and 10.629.

10.691 Basic Mathematics 1 (3 q.h.)

Review of elementary algebra: algebraic expressions and operations, equations, word problems. *Note: Credit cannot be used in Lincoln College degree programs.*

10.692 Basic Mathematics 2 (3 q.h.)

Further review: operations with polynomials, factoring, fractional expressions, word problems. *Note: Credit cannot be used in Lincoln College degree programs. Prereq. 10.691.*

10: Mathematics (Lincoln College)

Note for Mathematics and Physics courses offered by Lincoln College: Tuition for all courses in Lincoln College is at the rate of \$82.50 per quarter hour of credit.

10.681 Introduction to Mathematics 1 (4 cl., 4 q.h.)

This credit cannot be used in the Associate in Engineering, Associate in Science, or the Bachelor of Engineering Technology degree programs. A comprehensive review of high school algebra, including: first-degree equations, factoring, fractions, fractional equations, ratio and proportion, word problems, and concepts of plane geometry.

10.682 Introduction to Mathematics 2 (4 cl., 4 q.h.)

This credit cannot be used in the Associate in Engineering, Associate in Science, or the Bachelor of Engineering Technology degree programs. Algebraic operations with complex fractions, mixed expressions, square roots, radicals, quadratic equations, simultaneous equations, graphs, and fractional zero and negative exponents; the geometry of the right triangle, areas of polygons and circles, and loci problems. *Prereq.* 10.681.

10.683 Applied Mathematics and Statistics (3 q.h.)

The use of mathematics as a guide to concise thinking; the application of mathematical methods to highlight significant data. The use of elementary analytical models to test and evaluate hypotheses. An examination of the role of chance in physical phenomena. The importance of the use of a relevant statistical model. Methods for the selection of a data base. *Prereq.* 10.682 or *equiv.*

10.607 College Algebra (4 cl., 4 q.h.)

Fundamental algebraic operations, complex numbers, radicals and exponents, functions, linear and quadratic equations, irrational equations, inequalities, variations, roots of polynomial equations. *Prereq.* *Math Placement Test* or 10.682. *Students intending to enroll in 10.607 will be given a placement test during registration. An unsatisfactory score on this test will require the student to enroll in 10.681 or 10.682 for additional preparation.*

10.608 Introduction to Calculus (4 cl., 4 q.h.)

Logarithms, trigonometric functions of angles in degrees and radians, trigonometric identities and equations, right triangles, oblique triangles, complex numbers in trigonometric form, systems of equations, determinants. *Prereq.* 10.607.

10.620 Calculus 1 (4 cl., 4 q.h.)

Plane analytic geometry: differentiation of algebraic functions; rate, motion, maximum and minimum problems; derivatives of higher order; curve sketching; basics in functions, limits, and continuity. *Prereq.* 10.608 or 10.408.

10.621 Calculus A (4 cl., 4 q.h.)

Introduction to analytical geometry, maximum and minimum critical points; mean value theorem; applications of the derivative; integration; applications of integration; differentiation and integration of logarithmic, exponential, trigonometric, and inverse trigonometric functions; integration by parts and by partial fractions. *Prereq.* 10.620 or 10.420.

10.316 Probability and Statistics 1 (2 cl., 2 q.h.)

Basic tools, e.g., sets, permutations, and combinations; probability and applications. *Prereq.* 10.608, 10.629, or 10.634.

10.317 Probability and Statistics 2 (2 cl., 2 q.h.)

Descriptive statistics, frequency distributions and prob-

ability density functions, normal and other distributions. *Prereq.* 10.316.

10.318 Probability and Statistics 3 (2 cl., 2 q.h.)

Bivariate distributions, correlation, statistical inference, and estimation regression. *Prereq.* 10.317.

11: Physics (Lincoln College)**11.604 General Physics 1** (2 cl., 2 q.h.)

Survey of Newtonian mechanics, kinematics and dynamics of particle motion, projectile and circular motion, rotational motion, conservation laws of energy and momentum. *Prereq.* 10.627 or *concurrently.*

11.605 General Physics 2 (2 cl., 2 q.h.)

Temperature, heat energy, mechanical equivalent of heat, wave motion, sound, Doppler's effect, properties of light, simple optical systems. *Prereq.* 11.604.

11.606 General Physics 3 (2 cl., 2 q.h.)

Fundamentals of electricity and magnetism, fields, potential, electric current, inductance, capacitance, electromagnetism, a-c and d-c series circuits. *Prereq.* 11.605.

11.681 Introductory Physics 1 (4 cl., 4 q.h.)

This credit cannot be used in the Associate in Engineering, Associate in Science, or the Bachelor of Engineering Technology degree programs. An introduction to mechanics: units of measurement, vectors, accelerated motion, and Newton's laws of motion.

11.682 Introductory Physics (4 cl., 4 q.h.)

This credit cannot be used in the Associate in Engineering, Associate in Science, or the Bachelor of Engineering Technology degree programs. Continuation of mechanics conservation of energy and momentum. Introduction to elements of heat, thermodynamics, light, and electromagnetism. *Prereq.* 11.681.

12: Chemistry

Consultant: Prof. P. Lequesne, Chairman, Chemistry Dept. (College of Arts and Sciences)

12.407 Modern Chemistry 1 (Introduction to Inorganic Chemistry) (2 cl., 2.4 lab, 3 q.h.)

Fundamental ideas of matter and energy, chemical bonding, chemical energy, water and solutions, colloids, ionic reactions, oxidation and reduction, acidity, radioactivity, air and water pollution. Topics will usually be discussed from the viewpoint of recent developments. The laboratory deals with experiments related to the lecture material. *The required laboratory for this course is designated 12.607, Lab for 12.407, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.407.* (Laboratory fee)

12.408 Modern Chemistry 2 (Introduction to Organic Chemistry) (2 cl., 2.4 lab, 3 q.h.)

Classes of organic compounds, including hydrocarbons, alcohols, ethers, aldehydes, ketones, carboxylic

acids, esters, amines, amides, and carbohydrates, including their relation to modern biology. The laboratory deals with experiments related to the lecture material. *The required laboratory for this course is designated 12.608, Lab for 12.408, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.408. Prereq. 12.407 or equiv. (Laboratory fee)*

12.409 Modern Chemistry 3 (Introduction to the Chemistry of Living Bodies) (2 cl., 2.4 lab, 3 q.h.)

Includes fats, proteins, enzymes, chemistry of digestion, and the chemical reactions to body fluids. The laboratory deals with experiments related to the lecture material. *The required laboratory for this course is designated 12.609, Lab for 12.409, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.409. Prereq. 12.408 or equiv. (Laboratory fee)*

12.415 Biochemistry 1 (3 cl., 3 q.h.)

The first quarter of a three-quarter sequence. Introduction to the biochemistry of the cell, including the occurrence, chemistry, and metabolism of carbohydrates, lipids, proteins, and nucleic acids. *Prereq. 12.433 or equiv.*

12.416 Biochemistry 2 (3 cl., 3 q.h.)

Continuation of Biochemistry 1. *Prereq. 12.415 or equiv.*

12.417 Biochemistry 3 (3 cl., 3 q.h.)

Continuation of Biochemistry 2. *Prereq. 12.416 or equiv.*

12.421 Analytical Chemistry 1 (2 cl., 2.4 lab, 3 q.h.)

Analytical procedures and techniques. Principles and practice of gravimetric methods of analysis. Laboratory work usually involves procedures and techniques of gravimetric analysis. *The required laboratory for this course is designated 12.621, Lab for 12.421, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.421. Prereq. 12.446 or equiv. (Laboratory fee)*

12.422 Analytical Chemistry 2 (2 cl., 2.4 lab, 3 q.h.)

Principles and practice of titrimetric methods of analysis. The laboratory work usually involves the procedures and techniques of volumetric analysis. *The required laboratory for this course is designated 12.622, Lab for 12.422, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.422. Prereq. 12.421 or equiv. (Laboratory fee)*

12.423 Analytical Chemistry 3 (2 cl., 2.4 lab, 3 q.h.)

Theories of spectrophotometry, chromatography, and selected electroanalytical methods. The laboratory usually involves instruments and procedures for electro-metric and optical methods of chemical analysis. *The required laboratory for this course is designated 12.623, Lab for 12.423, and generally meets on the same night. You must register also for this laboratory to receive*

credit for 12.423. Prereq. 12.422 or equiv. (Laboratory fee)

12.427 Analytical Chemistry (Lectures and laboratory, 4 q.h., summer quarter only.)

Survey of principles and theories of volumetric, gravimetric, and instrumental analysis. Application made in the laboratory with analyses of unknown samples. *The required laboratory for this course is designated 12.627, Lab for 12.427, and generally meets on a different night. You must register also for this laboratory to receive credit for 12.427. Prereq. General Chemistry or equiv. (Laboratory fee)*

12.431 Organic Chemistry 1 (2 cl., 4 lab and disc., 4 q.h.)

Nature of carbon in organic compounds. General principles of structure, nomenclature, preparation, uses, and reactions of aliphatic hydrocarbons: alkanes, alkenes, alkynes, dienes, cycloalkanes. Position and geometric isomerism. Introduction to free radical and ionic mechanisms of reactions. The laboratory generally deals with the preparation and properties of compounds discussed in lecture. *The required laboratory and discussion for this course is designated 12.631, Lab for 12.431, and generally meets on a different night. You must register also for this laboratory and discussion to receive credit for 12.431. Prereq. 12.446 or equiv. (Laboratory fee)*

12.432 Organic Chemistry 2 (2 cl., 4 lab and disc., 4 q.h.)

Structure of benzene, electrophilic aromatic substitution reactions. General principles of structure, nomenclature, preparation, uses, and reactions of the various types of organic compounds, including: alcohols, alkyl and aryl halides, ethers and epoxides, and carboxylic acids. Optical isomerism and introductory chemical kinetics will be discussed. The laboratory generally deals with the preparation and properties of compounds discussed. *The required laboratory and discussion for this course is designated 12.632, Lab for 12.432, and generally meets on a different night. You must register also for this laboratory and discussion to receive credit for 12.432. Prereq. 12.431 or equiv. (Laboratory fee)*

12.433 Organic Chemistry 3 (2 cl., 4 lab and disc., 4 q.h.)

Continuation of 12.432, with emphasis on the application of chemical conversions to synthetic problems. Functional derivatives of carboxylic acids, sulfonic acids and their derivatives, amines, diazonium compounds, phenols, aldehydes, and ketones. The laboratory generally deals with the preparation and properties of compounds discussed. *The required laboratory and discussion for this course is designated 12.633, Lab for 12.433, and generally meets on a different night. You must register also for this laboratory and discussion to receive credit for 12.433. Prereq. 12.432 or equiv. (Laboratory fee)*

12.441 Physical Chemistry 1 (3 cl., 3 q.h.)

Thermodynamics, thermochemistry, First and Second Laws, entropy and free energy in spontaneous processes. *Prereq.* 10.323, 11.306, and 12.446 or equiv.

12.442 Physical Chemistry 2 (3 cl., 3 q.h.)

Chemical equilibria, acids and bases, electrochemistry, colligative properties, phase diagrams, thermodynamics of multicomponent systems, kinetic molecular theory. *Prereq.* 12.441 or equiv.

12.443 Physical Chemistry 3 (3 cl., 3 q.h.)

Kinetics, quantum chemistry, photochemistry. *Prereq.* 12.442 or equiv.

12.444 General Chemistry 1 (2 cl., 2.4 lab, 3 q.h.)

Fundamental concepts: symbols, formulas, equations, atomic weights, and calculations based on equations. Gases, liquids, solutions, and ionization. The laboratory generally deals with experiments related to the lectures. *The required laboratory for this course is designated 12.644, Lab for 12.444, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.444. Prereq.* 10.629 or equiv. (or taken concurrently). (Not open to those students with credit for 12.311 or 12.314.) (Laboratory fee)

12.445 General Chemistry 2 (2 cl., 2.4 lab, 3 q.h.)

Atomic structure, bonding, and molecular structure. Oxidation and reduction reactions, equilibrium and kinetics. The laboratory generally deals with experiments related to the lectures. *The required laboratory for this course is designated 12.645, Lab for 12.445, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.445. Prereq.* 12.444 or equiv. (Not open to those students with credit for 12.312 or 12.315.) (Laboratory fee)

12.446 General Chemistry 3 (2 cl., 2.4 lab, 3 q.h.)

Thermochemistry and electrochemistry; acids, bases, and solubility product; nuclear chemistry; introductory organic chemistry and biochemistry. The laboratory usually deals with experiments related to the lectures. *The required laboratory for this course is designated 12.646, Lab for 12.446, and generally meets on the same night. You must register also for this laboratory to receive credit for 12.446. Prereq.* 12.445 or equiv. (Not open to those students with credit for 12.313 or 12.316.) (Laboratory fee)

12.450 Chemistry and the Environment (3 cl., 3 q.h.)

This course is designed to acquaint nonscience students with the chemical aspects of the environment. Topics discussed generally include: air and water pollution, nuclear fallout, radiation damage, the effects of pesticides, aerosols, food additives, etc., and their relation to public health. The necessary foundation of chemical principles will be presented.

12.451 Instrumental Analysis 1* (formerly Instrumental and Radiochemistry 1) (3 cl., 3 q.h.)

Basic theory and instruments used in electrochemical analysis. Course generally includes such topics as elec-

trode and cell potentials, potentiometric titrations, direct potentiometry (pH meters and specific ion electrodes), coulometry, polarography, amperometry, electrogravimetry, and conductivity. *Prereq.* 12.423 or equiv. (This course and 12.452 can serve as preparation for certain graduate courses.)

12.452 Instrumental Analysis 2* (formerly Instrumental and Radiochemistry 2) (3 cl., 3 q.h.)

Basic theory and instruments used in spectrochemical analysis. Course generally includes such topics as electromagnetic spectrum, ultraviolet and visible spectrophotometry, infrared spectrophotometry, X-ray analysis, fluorescence and phosphorescence, emission spectrophotometry, absorption spectrophotometry, and chromatography. *Prereq.* 12.451 or equiv. (This course and 12.451 can serve as preparation for certain graduate courses.)

12.453 Radiochemistry* (formerly Instrumental and Radiochemistry 3) (3 cl., 3 q.h.)

Radioactivity and nuclear reactions, production and study of nuclear reactions, equations of radioactive decay, nuclear states and radioactive processes, interaction of radiation with matter, radiation detection and measurement, statistics of radioactivity measurements, techniques for the study of radionuclides, tracers in chemical applications, and nuclear energy. *Prereq.* 12.452 or equiv.

12.454 Introduction to Polymer Chemistry (3 cl., 3 q.h.)

Natural, modified, and synthetic polymers; plastics, fibers, and rubbers; condensation polymerization; addition polymerization in bulk, solution, and emulsion; kinetics; molecular weight; physical properties; uses. *Prereq.* 10.320, 12.433 or equiv.

12.460 Chemistry Workshop (3 cl., 0 q.h.)

A discussion and problem-solving session that will help reinforce and reexamine the material covered in 12.444, 12.445, and 12.446. Content is programmed according to needs of the students, and the classes are small and informal.

16: Earth Science

Consultant: Prof. D. Wilmarth, Earth Sciences (College of Arts and Sciences)

16.301 Earth Sciences 1 (3 q.h.)

The fundamental components of the solid Earth and their modes of organization; the structure of the solid Earth; its mode of forming its crustal exterior; the role of the oceans in building and shaping the continental masses.

16.302 Earth Sciences 2 (3 q.h.)

The gaseous components of the fluid Earth and their organization into masses, systems, and mass interaction. The long-range consequences of the fluid Earth's effects upon the solid Earth in the reshaping of landforms and the production of new land masses.

16.303 Earth Sciences 3 (3 q.h.)

A study of the Earth as an object in space; the history of the Earth as identified in the solid materials of the Earth; the implications of the Earth's history for the other members of the solar system; the solar system as a model for the universe.

16.304 Earth Sciences (Intensive) (9 q.h.)

A composite of 16.301, 16.302, and 16.303, as a one-quarter course.

16.311 History of Ancient World Sciences and Technologies (3 q.h.)

An in-depth study of selected sciences and technologies characterizing the ancient world. Classes are a combination of lecture-discussion, seminars based upon independent research, and extensive outside reading.

16.312 History of Modern World Sciences and Technologies (3 q.h.)

A continuation of 16.311, beginning with the period of the Western-world renaissances. Continues to the present with the implications of contemporary sciences and technologies for the immediate future.

16.324 Principles of Geology 1 (3 q.h.)

A detailed analysis of the crustal components of the Earth, their modes of formation, and the forces involved in their shaping; the relation of these factors to the structure and processes of the Earth's interior.

16.325 Principles of Geology 2 (3 q.h.)

The forces and processes involved in the alteration, transportation, and deposition of crustal materials; their effects on the Earth's landforms. The interactions of the oceans with the land masses. *(Not open to students who have credit for 16.521.)*

16.326 Principles of Geology 3 (3 q.h.)

A detailed study of the sedimentary and radiochemical deposits of the Earth and their relevant contributions to understanding the history of the Earth.

16.327 Descriptive Mineralogy (3 q.h.)

The significance of atomic structure to the crystalline forms of mineral materials; the forces and factors that are responsible for the formations of minerals in the rock materials of the Earth's crust.

16.328 Igneous and Metamorphic Petrology (3 q.h.)

The details of volcanic factors that produce igneous rock types; the internal and external crustal forces and motions that re-form all previously existing rock types.

16.329 Sedimentary Petrology (3 q.h.)

The processes and forces that provide the materials for sedimentary rock forms; the rock types that evolve with time and their stratigraphic significance.

16.331 Principles of Oceanology 1 (3 q.h.)

In-depth study of the origin of the global ocean; the physical and chemical properties of sea water; devel-

opment of ocean currents and their effects on land masses of the world; problems of ocean pollution.

16.332 Principles of Oceanology 2 (3 q.h.)

The habitat zones and organisms of the sea; economic importance of marine resources for expanding world population.

16.333 Principles of Oceanology 3 (3 q.h.)

Physiography and structure of ocean basins; marine geological processes and features; sedimentation, erosion, shorelines, and bottom topography; methods and techniques of marine geological explorations.

16.334 Fisheries Oceanology 1 (3 q.h.)

Survey of commercially important marine organisms; life and distribution of commercially important seaweed, shellfish, and fishes; population dynamics and fishery potential of the world's oceans; analysis of fishery stocks and sea farming.

16.335 Fisheries Oceanology 2 (3 q.h.)

Examination of fishery methods and techniques around the world; recent technological advancement; commercial products and applications of marine organisms; special emphasis on marine products of commerce from the New England area; chemical, industrial, and dietary applications of marine products.

16.336 Marine Resources (3 q.h.)

Quantitative and qualitative consideration of energy from the marine environment; current technological developments in the use of tidal power, off-shore oil, natural gas, thermal and nuclear energy from the sea. Food resources of the sea; analysis of world marine food production; marine food technology, conservation, and mariculture. Coastal zone recreational resources: beaches, artificial fishing reefs; shore erosion; SCUBA, boating, sailing, angling, and surfing.

16.341 Principles of Meteorology 1 (3 q.h.)

An in-depth study of the composition and structure of the atmosphere, the issue of the solar energy input, and the physical consequences for the dynamics of the atmosphere.

16.342 Principles of Meteorology 2 (3 q.h.)

The formation and behavior of air masses, interactions of air masses, the formation of fronts and storms.

16.343 Principles of Meteorology 3 (3 q.h.)

The practices and procedures of weather reporting and forecasting, the formulation of weather maps, the historical weather record and its value for the studies of world climatology.

16.351 Principles of Astronomy 1 (3 q.h.)

The nature and scope of astronomy, the geocentric universe, the heliocentric universe, celestial reference systems, time and the calendar, the sun-moon-earth system, astronomical instruments.

16.352 Principles of Astronomy 2 (3 q.h.)

The solar system, the inner planets, the outer minor planets, the outer major planets, the telescopic planets, the asteroid belt, meteors, comets, the sun as a source of energy and center of organization.

16.353 Principles of Astronomy 3 (3 q.h.)

The triangulation of space, stellar population, star color and motion, star systems, stellar evolution, galaxies.

16.354 Observational Astronomy (3 q.h.)

An introduction to the planets, stars, and constellations that are visible to the naked eye. Lectures, the planetarium, and actual viewing sessions are all used during the course. Primary emphasis will be placed on those stars and constellations easily seen from mid-northern latitudes.

16.355 Solar System Astronomy (3 q.h.)

A detailed examination of the individual components of the solar system. Contemporary results from the space probes are used to reassess our understandings of the origin and development of the solar system.

16.356 Celestial Astronomy 1 (3 q.h.)

An examination of the sun as a model star; variations of characteristics in single stars, star systems, stellar populations; the H-R diagram and stellar evolution; the significance of radio astronomy for stellar structure and stellar evolution.

16.357 Celestial Astronomy 2 (3 q.h.)

The structure and organization of the Milky Way galaxy; the nature of interstellar and intergalactic space, quasars, pulsars, black holes; cosmology.

16.371 Principles of Conservation 1 (3 q.h.)

Philosophy of conservation, historical development of the conservation movement in the U.S. since 1900, interactions of economics and conservation practices.

16.372 Principles of Conservation 2 (3 q.h.)

Problems relating to the supply, use, and management of major renewable natural resources: forests, soil, wildlife, and water.

16.373 Principles of Conservation 3 (3 q.h.)

Application of the theories and techniques of conservation, problems of urban resources, air and water pollution, recreational resources, the availability of funds.

16.374 Conservation and the Nation (3 q.h.)

In-depth study of the current practices and problems in our nation, mineral resources availability and allocation, energy resources, atmospheric and fresh and salt water pollution, wildlife and endangered species.

16.375 Conservation and the Community (3 q.h.)

Examination of the conservation problems at the local level, identification of the problem, the factors involved, the dimension of the problem, the responsibility of the community.

16.376 Conservation Management (3 q.h.)

Assessment of current practices of the local community, sources of knowledge and assistance among the populace, agencies available to the community, nature and scope of practices needed, practicality of community action.

18: Biology

Consultant: Prof. F. A. Rosenberg (College of Arts and Sciences)

18.407 Gross Anatomy and General Physiology 1 (3 cl., 3 q.h.)

Fundamental concepts of living organisms; chemical and biological characteristics of cellular metabolism; the skeletal system and its appendages; general nomenclature, anatomical names and terms.

18.408 Gross Anatomy and General Physiology 2 (3 cl., 3 q.h.)

The systems of the body, the relations between them, the structure and function of each. *Prereq.* 18.407 or *equiv.*

18.409 Gross Anatomy and General Physiology 3 (3 cl., 3 q.h.)

Continuation of 18.408. *Prereq.* 18.408 or *equiv.*

18.411 Biology 1 (General) (3 cl., 3 lab., 4 q.h.)

Universal properties and processes of living organisms, cellular composition and cellular activities, inheritance and cellular control. *The required laboratory for this course is designated 18.611, Lab for 18.411, and generally meets on a different night. You must register also for this laboratory to receive credit for 18.411. (Laboratory fee)*

18.412 Biology 2 (Animal) (3 cl., 3 lab., 4 q.h.)

Functional anatomy of animal organ systems, their interactions and environmental relationships. *The required laboratory for this course is designated 18.612, Lab for 18.412, and generally meets on a different night. You must register also for this laboratory to receive credit for 18.412. Prereq.* 18.411 or *equiv.* (Laboratory fee)

18.413 Biology 3 (Animal) (3 cl., 3 lab., 4 q.h.)

Systematic comparative study of the structure and functions of animals. Diversity of animals considered from the standpoint of evolutionary adaptation. *The required laboratory for this course is designated 18.613, Lab for 18.413, and generally meets on a different night. You must register also for this laboratory to receive credit for 18.413. Prereq.* 18.412 or *equiv.* (Laboratory fee)

18.419 Plant Biology (3 cl., 3 lab., 4 q.h.)

Systematic study of the structure and function of plants, principally vascular plants; survey of the plant-like protists and monerans. *The required laboratory for this course is designated 18.619, Lab for 18.419, and generally meets on a different night. You must register also*

for this laboratory to receive credit for 18.419. *Prereq.* 18.411 or equiv. (Laboratory fee)

18.420 Medical Microbiology (2 cl., 4 lab., 4 q.h.)

Major characteristics of disease-producing organisms. *The required laboratory for this course is designated 18.620, Lab for 18.420, and generally meets on a different day. You must register also for this laboratory to receive credit for 18.420. Prereq.* A formal course or professional laboratory experience in bacteriology. (Laboratory fee)

18.421 Microbiology 1 (2 cl., 3 lab., 3 q.h.)

Morphology and biochemistry of the bacteria. *The required laboratory for this course is designated 18.621, Lab for 18.421, and generally meets on a different night. You must register also for this laboratory to receive credit for 18.421. Prereq.* 18.413 or equiv. (Laboratory fee)

18.422 Microbiology 2 (2 cl., 3 lab., 3 q.h.)

Survey of pathogenic microorganisms. *The required laboratory for this course is designated 18.622, Lab for 18.422, and generally meets on a different night. You must register also for this laboratory to receive credit for 18.422. Prereq.* 18.421 or equiv. (Laboratory fee)

18.423 Microbiology 3 (2 cl., 3 lab., 3 q.h.)

Characteristics and role of microorganisms in the environment. *The required laboratory for this course is designated 18.623, Lab for 18.423, and generally meets on a different night. You must register also for this laboratory to receive credit for 18.423. Prereq.* 18.422 or equiv. (Laboratory fee)

18.424 Human Anatomy and Physiology 1 (2 cl., 2 lab., 3 q.h.)

Introduction to human anatomy; osteology; anatomy of the muscular, respiratory, digestive, vascular, and urogenital systems. The laboratory generally includes a study of human bone and cat dissection. *The required laboratory for this course is designated 18.624, Lab for 18.424, and generally meets on the same night. You must register also for this laboratory to receive credit for 18.424. Prereq.* 18.413 or equiv. (Laboratory fee)

18.425 Human Anatomy and Physiology 2 (2 cl., 2 lab., 3 q.h.)

Principles of physiology and continuation of the study of human anatomy. The laboratory is mainly concerned with muscle physiology. *The required laboratory for this course is designated 18.625, Lab for 18.425, and generally meets on the same night. You must register also for this laboratory to receive credit for 18.425. Prereq.* 18.424 or equiv. (Laboratory fee)

18.426 Human Anatomy and Physiology 3 ((2 cl., 2 lab., 3 q.h.)

Continuation of the principles of physiology. The anatomy and physiology of the nervous system, physiology of the endocrine system. The laboratory generally deals with the physiology of respiration and the physiology of

blood. *The required laboratory for this course is designated 18.626, Lab for 18.426, and generally meets on the same night. You must register also for this laboratory to receive credit for 18.426. Prereq.* 18.425 or equiv. (Laboratory fee)

18.430 Horticulture (3 q.h.)

The study of the science and art of plants, stressing the use of plants in the home and community. *The required laboratory for this course is designated 18.630, Lab for 18.430, and generally meets on the same day. You must register for this laboratory to receive credit for 18.430. (Laboratory fee)*

18.431 Cell Biology 1 (3 cl., 3 q.h.)

Chemical composition of cells, structure of cells and organelles, transport processes, cell motion and excitability, growth. *Prereq.* 18.413, 18.458, and 12.433 or equiv.

18.432 Cell Biology 2 (3 cl., 3 q.h.)

Cellular energy supply, enzyme function, respiration and metabolism, photosynthesis and other synthetic pathways, control of cellular process. *Prereq.* 18.431 or equiv.

18.433 Cell Biology Laboratory (4 lab., 2 q.h.)

Laboratory techniques in cell biology, microscopy, structure and chemical composition of cells, enzyme measurements, photosynthesis, respiration, active transport, growth. *Each class session lasts longer than in 18.431 or 18.432. Prereq.* 18.432 or equiv. (Laboratory fee)

18.435 Advanced Horticulture (3 q.h.)

The advanced study of the art and science of using plants for home and community. Special emphasis will be accorded various philosophies involving plants and humans. *The required laboratory for this course is designated 18.635, Lab for 18.435, and generally meets on the same day. You must register for this laboratory to receive credit for 18.435. Prereq.* 18.430. (Laboratory fee)

18.438 Immunology (2 cl., 4 lab., 4 q.h.)

Biological, chemical, and physical attributes of antigens and antibodies, together with their serological interactions. *The required laboratory for this course is designated 18.638, Lab for 18.438, and generally meets on a different day. You must register also for this laboratory to receive credit for 18.438. Prereq.* 18.423, 12.433 or equiv. (Laboratory fee)

18.451 Histology-Organology 1 (1 cl., 2 lab., 2 q.h.)

The morphology of cells and tissues. *The required laboratory for this course is designated 18.651, Lab for 18.451, and generally meets on the same night. You must register also for this laboratory to receive credit for 18.451. Prereq.* 18.413 or equiv. (Laboratory fee)

18.452 Histology-Organology 2 (1 cl., 2 lab., 2 q.h.)

The tissue components of the integumentary, digestive, and respiratory systems. *The required laboratory for this*

course is designated 18.652, Lab for 18.452, and generally meets on the same night. You must register also for this laboratory to receive credit for 18.452. *Prereq.* 18.451 or equiv. (Laboratory fee)

18.453 Histology-Organology 3 (1 cl., 2 lab., 2 q.h.)

The tissue components of the cardiovascular, excretory, reproductive, and endocrine systems. *The required laboratory for this course is designated 18.653, Lab for 18.453, and generally meets on the same night. You must register also for this laboratory to receive credit for 18.453. Prereq.* 18.452 or equiv. (Laboratory fee)

18.457 Genetics 1 (3 cl., 3 q.h.)

Mitosis, meiosis, and Mendelian genetics. *Prereq.* 18.413, 12.446 or equiv.; 10.308, 10.529 or equiv.

18.458 Genetics 2 (3 cl., 3 q.h.)

Chromosome mapping, mutations, translocation, chromosomal aberrations. *Prereq.* 18.457 or equiv.

18.459 Genetics Laboratory (4 lab., 2 q.h.)

Laboratory exercises involving principles of Mendelian inheritance, linkage, crossing-over. Classical genetics utilizing *Drosophila*; biochemical studies utilizing *Neurospora*. Each class session lasts longer than in 18.457 or 18.458. *Prereq.* 18.458 or equiv. (Laboratory fee)

18.461 Ecology 1 (3 cl., 3 q.h.)

Environmental factors; the soil system; water; the atmosphere; temperature, light, wind, pressure; the physico-chemical factors—CO₂, N, and mineral nutrients; habitat; distribution of plants and animals in the world according to temperature and precipitation. *Prereq.* 18.413 or equiv.

18.462 Ecology 2 (3 cl., 3 q.h.)

The ecosystem; ecological niche; producers, consumers, and decomposers; the pond, desert, forest, and seashore ecosystems; energy cycle and efficiency of energy utilization; mass, weight, and energy pyramids. *Prereq.* 18.461 or equiv.

18.463 Ecology 3 (3 cl., 3 q.h.)

Population ecology, biotic community, population growth, relations between the species, symbiosis, competition, predation, succession. *Prereq.* 18.462 or equiv.

18.464 Man and His Biosphere 1 (3 cl., 3 q.h.)

An ecological analysis of the human situation and man's interaction with other organisms. The necessary foundation of biological principles will be presented.

18.465 Man and His Biosphere 2 (3 cl., 3 q.h.)

A continuation of 18.464. *Prereq.* 18.464 or equiv.

18.474 Advanced Human Physiology (3 q.h.)

Study of human physiology emphasizing the cellular processes underlying organ functions and the interactions and control of organ systems. Selected physiological topics will be considered from these viewpoints as time allows. Reading to supplement material covered in

lecture will be required. *Prereq.* 18.426 and 12.446 or equiv.

18.475 Advanced Human Physiology 2 (3 q.h.)

Continuation of 18.474. *Prereq.* 18.474.

18.601 Botany for Horticulture 1 (2 cl., 3 lab., 3 q.h.)

Designed to acquaint the gardener or horticulturist with the botanical principles behind good horticultural practice. Topics: basic anatomical and cellular structure of higher plants and basic growth functions of cell division, development, reproduction, respiration, and photosynthesis. Horticultural plants will be used as examples. (Laboratory fee)

18.602 Botany for Horticulture 2 (2 cl., 3 lab., 3 q.h.)

A sequel to Botany for Horticulture 1, 18.601. Covers more detailed physiological and anatomical aspects of plant structure, growth, and development. Included will be structural/functional stages of the plant life cycle: germinant hormones, tropisms, mineral and water uptake, light responses, and flower and seed production. *Prereq.* 18.601 or equiv. (Laboratory fee)

18.606 Greenhouse Propagation and Germination (2 cl., 3 lab., 3 q.h.)

Survey of vegetative propagation techniques and germination of herbaceous plant seeds. Greenhouse lab work will include practice with various forms of division, layering and spore propagation, and study of underlying botanical activities. *Prereq.* 18.601 or equiv. (Laboratory fee)

19: Psychology

Consultant: Prof. Charles Karis, Psychology Dept. (College of Arts and Sciences)

Associate Consultant: Prof. Harold Zamansky, Psychology Dept. (College of Arts and Sciences)

19.301 Introduction to Psychology: Fundamental Issues* (formerly Psychology 1) (3 q.h.)

An introduction to the fundamental principles and issues of contemporary scientific psychology. The study of psychology is approached as a method of inquiry as well as a body of knowledge. Areas covered include the origins and methods of psychology, biological foundations of behavior, states of consciousness, learning, and memory.

19.302 Introduction to Psychology: Developmental Aspects* (formerly Psychology 2) (3 q.h.)

An emphasis on growth and the life cycle, language, mental abilities, sensory and perceptual processes, and social interaction. *Prereq.* 19.301 or equiv.

19.303 Introduction to Psychology: Personal Dynamics* (formerly Psychology 3) (3 q.h.)

An emphasis on motivation, emotion, personality theory and measurement, abnormal psychology, and therapy. *Prereq.* 19.301 or equiv.

19.304 Statistics in Psychology 1 (3 q.h.)

Scales of measurement in psychological research,

measures of central tendency, and variability. *Prereq.* 19.302 and 19.303 or equiv.

19.305 Statistics in Psychology 2 (3 q.h.)

Measures of correlation, introduction to probability, and statistical distributions. *Prereq.* 19.304 or equiv.

19.306 Statistics in Psychology 3 (3 q.h.)

Parametric and nonparametric tests of significance, including chi square, t-test, F test, and simple analysis of variance. *Prereq.* 19.305.

19.307 Introduction to Psychology (Intensive)*

(formerly Psychology Intensive) (9 q.h.)

A combination of 19.301, 19.302, and 19.303.

19.311 Developmental Psychology 1 (3 q.h.)

Development of the human individual from birth through early childhood. Includes the study of biological bases of development, sensory and motor functions, learning, socialization, perception and cognition, language, intelligence, and personality. In addition, specific topics such as the general heredity-environment question will be considered. *Prereq.* 19.302 or equiv.

19.312 Developmental Psychology 2 (3 q.h.)

Continuation of 19.311 with focus on childhood and adolescence. *Prereq.* 19.311 or equiv.

19.313 Developmental Psychology 3 (3 q.h.)

Continuation of 19.312 with focus on adulthood and old age. *Prereq.* 19.312 or equiv.

19.314 Personality 1 (3 q.h.)

A systematic study of the normal personality, its growth and development. Topics generally include environmental and constitutional contributions, assessment of personality, research, and a survey of the major theories of personality. *Prereq.* 19.303 or equiv.

19.315 Personality 2 (Laboratory) (3 q.h.)

Introduction to methods and areas of research in personality. Usually includes problems of measurement, behavioral and dynamic concepts, and laboratory projects. *Prereq.* 19.314 or equiv.

19.323 Motivation (3 q.h.)

Survey of the various aspects of motivation. Such areas as primary and secondary reinforcement, unconscious motivation, effectance motivation, and the assessment of motives will be considered. *Prereq.* 19.303 or equiv.

19.324 Social Psychology 1 (3 q.h.)

The socialization process, social motives, interpersonal perception, group membership and structure. *Prereq.* 19.302 or equiv.

19.325 Social Psychology 2 (3 q.h.)

Attitudes, prejudice and ethnic relations, leadership, mass behavior and social movements, and the effects of mass media on communication. *Prereq.* 19.324 or equiv.

19.332 Industrial Psychology 1 (3 q.h.)

Psychology as applied to industry, including such topics as history, causation, selection and placement procedures, employee assessment, individual differences and their evaluation, and the place of psychological tests in industry. *Prereq.* 19.302 or 19.303 or equiv.

19.333 Industrial Psychology 2 (3 q.h.)

Personnel training and development, motivation and work, attitudes and job satisfaction, engineering psychology, human factors in accident causation. *Prereq.* 19.332 or equiv.

19.334 Industrial Psychology 3 (3 q.h.)

Supervision and leadership, morale, personnel counseling, the psychology of labor-management relations, human relations, and organizational behavior. *Prereq.* 19.333 or equiv.

19.338 Psychology of Learning 1 (3 q.h.)

An analysis of the basic principles and techniques of operant and Pavlovian conditioning. Applications to therapeutic, educational, and specialized training programs will be considered. *Prereq.* 19.302 or 19.303 or equiv.

19.340 Psychology of Learning 2 (Laboratory) (3 q.h.)

Through direct experience, students may gain proficiency in the laboratory analysis of behavior and in evaluating common generalizations about human behavior. Students may design and perform experiments in animal and human learning, memory, decision processes, concept formation, and other topics of individual interest. *Prereq.* 19.338 or equiv.

19.341 Abnormal Psychology 1 (3 q.h.)

An introduction to the study of the etiology and dynamics of the abnormal personality. *Prereq.* 19.303 or equiv.

19.342 Abnormal Psychology 2 (3 q.h.)

The symptomatology and treatment of the neuroses and psychoses. *Prereq.* 19.341 or equiv.

19.343 Abnormal Psychology 3 (3 q.h.)

Psychosomatic, psychopathic, and organic disorders; varieties of psychotherapy. *Prereq.* 19.342 or equiv.

19.344 Abnormal Psychology (Intensive) (9 q.h.)

Same as 19.341, 19.342, and 19.343. *Prereq.* 19.303 or equiv.

19.345 Psychological Therapies (3 q.h.)

A survey of techniques for treating deviant behavior, from classical psychoanalytical therapies through methods of behavior modification. *Prereq.* 19.343 or equiv.

19.349 Sensation and Perception 1 (3 q.h.)

An introduction to the nature of the perceptual world; the nature of object recognition and identification; spatial organization; contextual effects; learning and perception; and the influence of attitudinal, motivational, and personality factors on perception. *Prereq.* 19.302 or equiv.

19.350 Sensation and Perception 2 (Laboratory) (3 q.h.)

Students usually do laboratory experiments on seeing, hearing, touching, and tasting. Studies may include dark adaptation, loudness, binaural interaction, brightness constancy, two-point touch thresholds, information processing, and interactions between the senses. *Prereq.* 19.349 or *equiv.*

19.351 Cognitive Psychology (3 q.h.)

An emphasis on the mental processes involved in the acquisition, organization, and use of knowledge, including pattern recognition and memory.

19.352 Psycholinguistics (3 q.h.)

A focus on the nature and structure of language, various theories of human production and perception of language, and related experimental findings.

19.360 Psychology of Women (3 q.h.)

The examination, in both historical and contemporary context, of the body of knowledge studying woman, her function in social roles, and her behavior as determined genetically, physiologically, and psychologically. Implications regarding future life styles, roles, and contributions of women will be considered.

19.361 Scientific Foundations of Psychology 1*
(formerly Historical Development of Psychology 1) (3 q.h.)

Historical development of psychology from its philosophical beginnings. *Prereq.* Two of the following: 19.315, 19.340, 19.350, 19.381.

19.362 Scientific Foundations of Psychology 2*
(formerly Historical Development of Psychology 2) (3 q.h.)

Major schools of psychology that have influenced modern psychological research, including functionalism, behaviorism, Gestalt psychology, and psychoanalysis. *Prereq.* 19.361 or *equiv.*

19.371 Senior Seminar in Psychology (3 q.h.)

Small groups of students meet to discuss topics in psychology of mutual interest. Each seminar has a different flavor, depending upon the student group and faculty. *Prereq.* Senior status or consent of instructor.

19.380 Physiological Psychology 1 (3 q.h.)

How nerves function and work together in the nervous system; how our sense organs provide the brain with information about the outside world; how the brain acts to produce behavior; and how such psychological concepts as perception, learning, motivation arousal, and emotion may relate to nervous system activity. *Prereq.* 19.302 or 19.303 or *equiv.*

19.381 Physiological Psychology 2 (Laboratory) (3 q.h.)

Laboratory experiments based on evolution of the nervous system, sensory and motor mechanisms, motivation and emotion, sleep, attention, perception, learning, and memory. *Prereq.* 19.380 or *equiv.*

19.388 Drugs and Behavior (3 q.h.)

The application of quantitative behavior techniques in animals and humans, to determine the behavioral effects of pharmacological agents. A systematic survey of the experimental literature. *Prereq.* 19.302 or 19.303 or *equiv.*

19.389 Impact of Psychology on Society (3 q.h.)

A consideration of such developments as the uses or intelligence and aptitude tests; psychosurgery and electroconvulsive therapy; techniques of behavior modification and control; minority and women's rights movements; direct brain stimulation by implanted electrodes; use of psychoactive drugs; use of the lie detector machine; and the application of experimental techniques to humans. *Prereq.* 19.302 or *equiv.*

19.391 Honors Program 1 (4 q.h.)

Prereq. Approval of the Dean.

19.392 Honors Program 2 (4 q.h.)

Prereq. 19.391.

19.393 Honors Program 3 (4 q.h.)

Prereq. 19.392.

19.401 Psychology A (6 q.h.)

Same as 19.301 and 19.302.

19.491 Directed Study 1 (3 q.h.)

An opportunity for qualified students to take an upper-class course in their major area on an individual basis. Petitions and procedural instructions are available in the office of University College Social Science Programs, 204 Churchill Hall, 617-437-2416. *Prereq.* 87 q.h.

19.492 Directed Study 2 (3 q.h.)

An opportunity to initiate a second individual study as described in 19.491. *Prereq.* 19.491.

19.499 Field Work in Psychology (6 q.h.)

Refer to page 69 describing field work courses. To be discussed with Department Consultant or Major Adviser prior to registration.

20: Anthropology

Consultant: (See Sociology)

20.301 Anthropology 1 (3 q.h.)

An introduction to elements of physical anthropology, covering such subjects as: the primates, fossil humans and evolution, problems of heredity and genetics, race and racial classifications, the bases of cultural behavior. (Not open to students who have credit for 21.401.)

20.302 Anthropology 2 (3 q.h.)

An introduction to socio-cultural anthropology. Examines the nature of language and the cultural institutions of human groups with simple foraging and horticultural adaptations. *Prereq.* 20.301 or *equiv.* (Not open to students who have credit for 21.402.)

20.303 Anthropology 3 (3 q.h.)

The institutions and cultures of technologically advanced societies and states. *Prereq.* 20.302 or equiv.

20.304 Anthropology (Intensive) (9 q.h.)

Same as 20.301, 20.302, and 20.303.

20.321 Individual and Culture (3 q.h.)

Cross-cultural comparisons of the socialization and enculturation of children and adults with respect to roles, values, and personality. Course may examine theories and methods used in psychological anthropology.

20.331 Social Organization of Non-State Societies (3 q.h.)

Detailed studies of the institutions of peoples with collecting-hunting and horticultural subsistence economies.

20.332 Religion in Cross-Cultural Perspective (3 q.h.)

Comparative analyses of the rituals, beliefs, and religious institutions of various human groups.

20.337 Anthropological Theory (3 q.h.)

History of the major orientations and philosophies in anthropology; evolutionist, culture area, and historical approaches; and functional, structural, ecological, and cognitive modes of analysis.

20.341 Native North American Peoples (3 q.h.)

Examines the past and present circumstances of a number of native North American peoples.

20.344 African Peoples and Cultures (3 q.h.)

African geography, prehistory, and culture; the spectrum of societal complexity, ranging from Mbuti egalitarianism to Ashanti federation; and the problems of political, economic, and social change in contemporary Africa.

20.347 Latin American Peoples and Cultures (3 q.h.)

The tribal and peasant adaptations of native and Hispanic populations to changing conditions in Latin America.

20.348 Sex, Sex Roles, and Family* (formerly Studying the Family Cross-Culturally) (3 q.h.)

Analyzes popular and scientific notions about sex and family by examining the social patterning of interactions in our culture, other cultures, and other species. Emphasizes the changing relationships between men and women.

20.349 Folklore (3 q.h.)

Folklore, art, and song in various societies and how they are studied. Contemporary American materials are examined.

20.360 Language and Culture (3 q.h.)

The functions of language and other forms of communication in human society. An introduction to analyses of the relation between patterns of communication and other aspects of culture.

20.428 Peasant Societies in a Changing World

(Replaces 20.333 and 20.350) (3 q.h.)

Analysis of changes affecting traditional peasant cultures in the non-Western and Western worlds. An examination of the processes occurring in situations involving culture contact, conquest, and colonialism.

20.499 Field Work in Anthropology (6 q.h.)

Refer to page 69 describing field work courses. To be arranged with a department field work adviser prior to registration. *Prereq.* Major in Sociology-Anthropology and completion of 15 credits in Anthropology. (Students may receive credit for only one department field work course. Credit for 20.499 precludes credit for 21.499. Students who are eligible for department Honors courses may take any combination of field work and Honors totaling three courses.)

21: Sociology

Consultant: Prof. Wilfred Holton, Sociology Dept. (College of Arts and Sciences)

Major Adviser/Associate Consultant: Prof. Thomas Shapiro, Sociology Dept. (College of Arts and Sciences)

21.301 Introduction to Sociology: Fundamental Issues* (formerly Sociology 1) (3 q.h.)

Covers the basic theoretical perspectives, research methods, and concepts of sociology, including society, status and role, socialization, and social groups. (Not open to students who have credit for 21.401.)

21.302 Introduction to Sociology: The Individual and Social Roles* (formerly Sociology 2) (3 q.h.)

Covers the involvement of individuals in society, including culture, social interaction, deviance, sex roles, sexuality, and family. *Prereq.* 21.301 or equiv. (Not open to students who have credit for 21.401 or 21.402.)

21.303 Introduction to Sociology: Critical Issues Facing Society* (formerly Sociology 3) (3 q.h.)

Explores social factors of importance, including business and industry, population and ecology, science and technology, class, and race and ethnic relations. *Prereq.* 21.301 or equiv. (Not open to students who have credit for 21.402.)

21.304 Introduction to Sociology (Intensive)* (formerly Sociology Intensive) (9 q.h.)

A combination of 21.301, 21.302, and 21.303.

21.305 Drugs and Society (3 q.h.)

An introduction to the sociology of drugs. Examines social definitions of drugs, conditions of their use, and socialization into drug use. Considers deviant drug use and effects of social control on definitions and use. A range of licit and illicit drugs will be considered.

21.306 Sociology of Religion (3 q.h.)

An examination of the role of religious belief systems and institutions in classical and Western societies.

21.307 Sex and Gender Roles in Society* (formerly Sex in Society: The Study of Sex Roles) (3 q.h.)

Analysis of historical and contemporary development in how men's and women's changing roles are related to society at large.

21.308 Sociology of Literature (3 q.h.)

Sociological analyses of the contexts and content of literary productions, such as novels, song lyrics, sci-fi, and films.

21.312 Social Research Methods 1: Generating and Investigating Research Problems (4 q.h.)

Methods for producing knowledge through social research will be examined. Emphasis will be placed upon the practical aspects of research, i.e., the problems that sociologists face in doing research and how they have solved these problems. Students will be required to design a small study.

21.313 Social Research Methods 2: Tabulating and Analyzing Social Data (4 q.h.)

Methods of tabulating, presenting, summarizing, and analyzing data. Students will be required to learn elementary descriptive and inferential statistics and how to use them. Statistics as a tool will be emphasized, and students will be introduced to the use of the computer. *Prereq.* 21.312 or *equiv.*

21.314 Social Research Methods 3: Doing Social Research (4 q.h.)

Students will be required to carry out the study they designed in Research Methods 1, analyze data, and report results. The ethics and politics of social research will be discussed, as will relations among social action, social research, and theory building. *Prereq.* 21.313 or *equiv.*

21.317 Social Theory 1 (3 q.h.)

A historical survey of sociological theorists, including the work of Tocqueville, Comte, Marx, Durkheim, Cooley, and others. *Prereq.* *Consent of the instructor* or 12 q.h. in *Sociology-Anthropology*.

21.318 Social Theory 2 (3 q.h.)

A study of major theoretical issues in sociology. Discussion concentrates on systematic questions and topics rather than on particular theorists, but material is drawn from theorists such as Weber, Simmel, Thomas, Mannheim, Merton, and Parsons. *Prereq.* 21.317 or *equiv.*

21.319 Social Theory 3 (3 q.h.)

A seminar in which the principal focus will be upon questions of theoretical interest, e.g., the problem of order, the problem of change, the role of the individual in change. Students will present papers in class. *Prereq.* 21.318 or *equiv.*

21.334 Social Control (3 q.h.)

The study of group membership as a determinant of behavior; analysis of status and role, patterns of au-

thority, power, and group ideology as factors in the evaluation of conduct.

21.341 Sociology of Sport (3 q.h.)

An analysis of games and sport from a sociological perspective, with particular reference to contemporary American society. Included are such topics as the role of play in modern society, the social organization of specific games and sports, and the relation of organized sport to the larger society.

21.346 Sociology of Deviant Behavior (3 q.h.)

Analysis of a variety of social problems with relation to the organization of society. Particular attention will be given to alcoholism, sex offenses, drug abuse, mental disorder, and other responses to conditions of urban industrial society.

21.347 Social Problems (3 q.h.)

An overview of contemporary American social problems and the application of sociological concepts, methods, and principals to these problems.

21.350 Juvenile Delinquency (3 q.h.)

A study of factors in juvenile delinquency and an examination of their implications for prevention, rehabilitation, and treatment.

21.351 Sociology of the Family 1* (formerly Family and Marriage 1) (3 q.h.)

A comparative and historical treatment stressing the past history and development of the family.

21.352 Sociology of the Family 2* (formerly Family and Marriage 2) (3 q.h.)

A continuation of Sociology of the Family 1, emphasizing the backgrounds of contemporary problems in the context of functions, forms, and processes of this institution.

21.353 Race and Ethnic Relations* (formerly Intergroup Relations 1) (3 q.h.)

A study of the relationships among various racial, national, cultural, and religious groups, with emphasis on the development of black-white relationships in American society. Covers the problems of contemporary minority peoples in American and other societies.

21.356 Poverty and Inequality* (formerly Sociology of Inequality) (3 q.h.)

An analysis of American class and ethnic differences in historical perspective, drawing on comparisons with other countries. Critical evaluation of sociological research and theories relating to the causes and effects of and societal responses to poverty. Suitable for students in applied fields such as nursing, criminal justice, education, allied health, pre-med, and pre-law.

21.357 Urban Sociology (3 q.h.)

Analyses of the various causes, characteristics, and effects of urbanization in several different cultures. Specific attention is given to the problem of urban and suburban living and the changing structure of the city.

21.358 Community Analysis (3 q.h.)

Demographic and ecological theories of man's relation to his physical environment. Development of the concept of community and discussion of community study methods. Contrasts between rural communities and urban neighborhoods. Discussion and evaluation of community action programs.

21.359 Seminar in Urban Studies (3 q.h.)

Interdisciplinary approaches to analyses of urban issues, continuing student projects. *Prereq.* One previous course in urban studies field.

21.360 Medical Sociology (3 q.h.)

Sociological concepts and research relating to the study of patterns of behavior in the areas of health and disease. Emphasis on the family, community, medical organizations, class, and status as social subsystems related to the field of health.

21.361 Sociology of Mental Health (3 q.h.)

Sociological aspects of mental health and mental disorder: the social history of mental illness, epidemiological and cross-cultural approaches to mental disorder, the career of the mental patient, the functions of psychiatry in society, community and social treatment modalities, and social psychiatry.

21.363 Social Gerontology: The Aged in Society (3 q.h.)

An examination of social factors involved in aging, with specific reference to how biological and psychological age changes influence behavior, social roles, and cultural patterns. The relation of aging to social change and special provisions for the elderly.

21.365 Sociology of Education (3 q.h.)

The comparative study of formal and informal educational systems. Emphasis will be placed on the structures and functioning of educational institutions for the larger societies of which they are a part.

21.370 Sociology of Occupations and Professions (3 q.h.)

Analysis of the social relations within occupational groups, of occupational structure, and of institutional aspects of an occupation. Relationships between supervisors, peers, colleagues, subordinates, and clientele; their significance for work-role behavior.

21.373 Sociology of Industry (3 q.h.)

Comparison of pre-industrial and industrial society, stressing the impact of industry on society and the relation between industry, culture, and values. Diversification, specialization, human relations, and formal and informal groups are dealt with.

21.375 Sociology of Formal Organizations: Humans, Machines, and Bureaucracy (3 q.h.)

A study of formal organizations and the principles that govern organizational life. Weber's theory of bureaucracy and the concept of authority; communication sys-

tems and other conceptions of formal organizations. The structure of work groups and their effect on the larger organization.

21.391 Honors Program 1 (4 q.h.)

Prereq. 21.312, 21.313, 21.314 and 21.317, 21.318, 21.319 and approval of the Dean. (Students may take any combination of field work and Honors totaling three courses.)

21.392 Honors Program 2 (4 q.h.)

Prereq. 21.391.

21.393 Honors Program 3 (4 q.h.)

Prereq. 21.392.

21.401 Principles of Sociology 1 (Recommended for majors) (4 q.h.)

An introduction to basic concepts and theories relating to the study of humans as participants in group life. Emphasis is placed on socialization, culture, social structure, primary groups, family, social stratification, and population. (Not open to students who have credit for 21.301 or 21.302.)

21.402 Principles of Sociology 2 (4 q.h.)

A continuation of Principles of Sociology 1, with emphasis on a critical analysis of American society with particular attention to problems of social, political, urban, and industrial change. *Prereq.* 21.401 or equiv. (Not open to students who have credit for 21.302 or 21.303.)

21.420 Sociology of Boston (3 q.h.)

The city of Boston from the perspectives of environmental development, neighborhood and intergroup relations, institutional services, and symbolic meanings. The city is a laboratory for exploring the people's search for a lifestyle and the satisfaction of their needs. Field trips with workbook. Use of documentary and literary sources for term paper report. (Does not meet elective requirement for Sociology/Anthropology major.)

21.421 Sociology of Business/Industry (3 q.h.)

The role of industry in modern society. Similarities and dissimilarities among industrial societies, bureaucracy and its alternatives, unions, supervision democracy and manipulation, the individual on the assembly line, sabotage of the organization, and the role of wages and alienation.

21.422 Sociology of Work (3 q.h.)

Study of the world of work, focusing on the development of occupational cultures, the nature of careers, and the meanings and implications of professionalization. As part of the course, students will be encouraged to do a project on an occupation they are considering for a career or one in which they have had practical experience on co-op.

21.423 Science and Society (3 q.h.)

Science has had a profound effect on our society, and scientists have seen the ways in which political, economic, and social forces have guided developments in

their fields. Issues such as the "responsibility" and "autonomy" created by this interdependence will be explored. Emphasis is on the social structures within which science operates and is communicated, science as an occupation and profession, and science as a system of thought and set of tools for producing knowledge.

21.425 Social Theory Intensive (Replaces 21.417 and 21.418) (9 q.h.)

A historical survey of sociological theorists, including the work of Tocqueville, Comte, Marx, Durkheim, Cooley, Weber, Simmel, and others. More recent material is drawn from theorists such as Mannheim, Merton, and Parsons. Students may be required to present papers in class on questions of theoretical interest, e.g., the problem of order, the problem of change, the role of the individual in change. *Prereq.* *Consent of the instructor or 12 q.h. in Sociology/Anthropology. (Not open to students who have credit for 21.317, 21.318, or 21.319.)*

21.426 Law and Society (3 q.h.)

The functions of law in modern society; legislation, litigation, and adjudication as social processes; the legal profession, the courts, and the administration of justice; an examination of laws and judicial decisions on controversial social issues; examination of laws regulating domestic, industrial, and other major social relationships.

21.427 Class, Power, and Social Change (Replaces 21.328, 21.331, and 21.335) (3 q.h.)

Theories of social equality and inequality as applied to the exercise of power and to the growth and development of social movements and group conflict, and as seen from the point of view of large-scale social change.

21.491 Directed Study 1 (3 q.h.)

An opportunity for qualified students to take an upper-level course in their major area on an individual basis. Petitions and procedural instructions are available in the office of University College Social Science Programs, 204 Churchill Hall, 617-437-2416.

21.492 Directed Study 2 (3 q.h.)

An opportunity to initiate individual study as described above. *Prereq.* 21.491.

21.499 Field Work in Sociology (6 q.h.)

Refer to page 69 describing field work courses. To be arranged with a department field work adviser prior to registration. *Prereq.* *Major in Sociology-Anthropology and completion of 15 credits in Sociology.* (Students may receive credit for only one department field work course. Credit for 21.499 precludes credits for 20.499. Students who are eligible for department Honors courses may take any combination of field work and Honors totaling three courses.)

25: Social Welfare

Course Coordinator: Prof. Wilfred Holton, Sociology Dept. (College of Arts and Sciences)

25.343 Introduction to Social Work Practice 1 (3 q.h.)

An introduction to the functions of the helping profession of social work, its settings and methods. Specific techniques such as interviewing, history taking, and recording skills are presented.

25.344 Introduction to Social Work Practice 2 (3 q.h.)

A continuation of Introduction to Social Work Practice 1, with particular attention to the functioning of social workers in selected settings.

25.345 Introduction to Social Work Practice 3 (3 q.h.)

A continuation of Introduction to Social Work Practice 2, with emphasis on enhancement of practice skills.

25.350 Human Services Professions (3 q.h.)

The human services, viewed from the perspectives of the recipient, the worker, and the society at large, are analyzed with respect to 1) why they are needed, 2) how agencies and programs developed, and 3) the basic skills, attitudes, values, and knowledge required of the human service worker today.

25.351 Sociology of Human Service Organizations (3 q.h.)

The structure and resource bases of various human service organizations are analyzed in terms of the types of services they offer, how these services are delivered, and the populations that are served. The managerial structure of traditional human service agencies and alternative community resource groups will be contrasted to better understand how well the needs of clients are being met.

25.352 Evaluation of Social Intervention (3 q.h.)

Introduces basic concepts of theory, practice, and evaluation in the human service programs. Specific programs will be critiqued and evaluated from both worker and client perspectives. Funding sources and the role of the community or larger agency will also be examined. Students are encouraged to bring in their own case materials for class discussion.

22: Political Science

Consultant: Prof. R. L. Cord, Political Science Dept. (College of Arts and Sciences)

Major advisor: Prof. Steve Worth

22.403 Introduction to Politics* (formerly 22.301, Principles of Political Science 1) (3 q.h.)

An introduction to contemporary political science, including consideration of basic concepts in political analysis, the role of government institutions, political representation, political ideologies, and the scope and methods of political science.

22.404 Introduction to American Government (3 q.h.)

An investigation of the American governmental and political processes, constitutional institutions, political behavior, and liberties.

22.405 Introduction to Comparative Politics (3 q.h.)

A comparative study of constitutional and totalitarian systems, including the Western European and Soviet patterns.

22.305 Contemporary Political Theory (3 q.h.)

Political ideas and systems of political thought from Machiavelli to the present. *Prereq.* 22.336 or *equiv.*

22.306 American Political Thought (3 q.h.)

Political thought from the colonial period to the present, including a study of the impact of religious, economic, and judicial theories on the structure of American ideas.

22.308 Research Methods (3 q.h.)

An introduction to some of the most common methods of carrying out research in the discipline of political science. Problems of theory construction and data gathering and a selection of analytical research tools, including bibliographical aids and the computer, are examined.

22.309 Public Policy Analysis (3 q.h.)

Procedures for the analysis of public policy, including discussion of selected cases of public policy at the local, state, or Federal level. *Prereq.* 22.316, 22.317.

22.310 Public Budgeting (3 q.h.)

The politics, procedures, and goals of government budgeting at the Federal, state, and local levels, including expense budgeting, capital budgeting, and program budgeting. *Prereq.* 22.316, 22.317.

22.311 Public Personnel Administration (3 q.h.)

The basic elements of personnel administration, including recruitment, training, classification, promotion, and executive development. Special attention will be given to current problems, such as equal opportunity, public employee unionism, and collective bargaining. *Prereq.* 22.316, 22.317.

22.312 Urban and Metropolitan Government (3 q.h.)

The political, structural, and functional problems of an urbanizing United States, including an analysis of urban, suburban, and metropolitan governments.

22.313 Political Parties and Pressure Groups (3 q.h.)

Party government in the United States and Great Britain. A contrasting study focusing on the interaction of party and government.

22.314 American Constitutional Law (3 q.h.)

A case analysis of the development of Federalism, the separation of powers, and the role of the Federal and state courts in constitutional development.

22.315 Civil Rights (3 q.h.)

An evaluation of the quality and content of civil liberties in the United States. Emphasis usually is placed on the first, fifth, sixth, fourteenth, and fifteenth amendments to the Constitution.

22.316 Public Administration 1 (3 q.h.)

An introduction to the theory, forms, and processes of administration at the national and state levels.

22.317 Public Administration 2 (3 q.h.)

Selected problems. Case study approach to examination of relation between the theory and practice of public administration. *Prereq.* 22.316 or *equiv.*

22.318 Government and Politics of the States (3 q.h.)

A study of state and local government, problems, and the functional and operational responses to them.

22.319 The Legislative Process (3 q.h.)

An institutional, functional analysis of the roles of Congress, the executive, and political parties in the legislative process.

22.320 The American Presidency (3 q.h.)

A multifaceted examination of the nation's Chief Executive: the presidential electoral process; the President's many constituencies; and the differing styles of various twentieth-century Presidents. The constitutional and extra-constitutional powers of the office are some areas considered.

22.321 Public Administration (Intensive) (6 q.h.)

Same as 22.316 and 22.317.

22.328 Procedural Due Process (3 q.h.)

A study of due process in the American Constitutional scheme.

22.329 Comparative Politics (Intensive) (4 q.h.)

A comparative analysis of political culture, organization, and behavior in different national settings.

22.332 International Organization (3 q.h.)

Development of international organizations, with special emphasis on the United Nations, specialized agencies, and regional organizations.

22.333 Formulating American Foreign Policy (3 q.h.)

The Constitution and political instruments for the formulation of American foreign policy.

22.334 Soviet Foreign Policy (3 q.h.)

A study of the evolution of Soviet foreign policy since 1917, with emphasis on the development of the international Communist movement.

22.335 International Relations (4 q.h.)

Elements of and limitations on national power. Contemporary world politics, problems of war, and peaceful coexistence.

22.336 Introduction to Political Theory (4 q.h.)

Development of the political ideas of the Western world. The major philosophers of Greece, Rome, the Christian Era, and the Renaissance.

22.337 European Political Parties (3 q.h.)

A study of political party systems in England, France, and Germany, emphasizing ideology, organization in and out of Parliament, electoral strategies, and voter behavior.

22.338 Communist China's Foreign Policy (3 q.h.)

A study of the Peking government's relations with Afro-Asia, the Soviet orbit, and the West. Attention is given to policy objectives, strategy, tactics, and the methods of decision making in both the party and state apparatus.

22.341 International Law (3 q.h.)

A procedural and substantive study of legal relations among nation-states.

22.342 American Foreign Policy 1 (3 q.h.)

Recent and current American foreign affairs.

22.343 American Foreign Policy 2 (3 q.h.)

Recent and current American foreign affairs, continued. *Prereq.* 22.342 or *equiv.*

22.344 Government and Politics in the Soviet Union 1 (3 q.h.)

An analysis of modern totalitarian theory and practice is followed by a study of the ideological and historical bases of the Soviet dictatorship. *Prereq.* 22.329 or *equiv.*

22.345 Government and Politics in the Soviet Union 2 (3 q.h.)

A continuation of 22.344. A study of the Soviet Federalism, party, and state organization, with special attention to the problems of political succession. *Prereq.* 22.344 or *equiv.*

22.347 Government and Politics of Communist China 1 (3 q.h.)

A study of Chinese political culture, with emphasis on the nineteenth-century cultural, economic, and political impact of the West, the emergence of the Communist Party under the leadership of Mao, and the progressive disintegration of Kuomintang leadership. *Prereq.* 22.329 or *equiv.*

22.348 Government and Politics of Communist China 2 (3 q.h.)

A study of ideology, party, and state organization and behavior, and the Cultural Revolution. *Prereq.* 22.347 or *equiv.*

22.351 Current Political Issues (3 q.h.)

A topical analysis of the constitutional and political basis of selected problems in American political life.

22.352 Government and Politics in the Middle East 1 (3 q.h.)

A study of political change, economic growth, and social adaptation in selected countries of the Middle East. Foreign policies are also considered, especially the ties of the Middle Eastern countries with Northern Africa. *Prereq.* 22.329 or *equiv.*

22.353 Government and Politics in the Middle East 2 (3 q.h.)

A continuation of 22.352. *Prereq.* 22.352 or *equiv.*

22.355 Government and Politics of Latin America 1 (3 q.h.)

Discussion of the historical background of the Latin American nations and analysis of their cultural, economic, social, and political characteristics, including political violence and the breakdown of democratic governments. *Prereq.* 22.329 or *equiv.*

22.356 Government and Politics of Latin America 2 (3 q.h.)

Analysis of politics of Mexico, Cuba, and Chile; comparison of the Communist; one-party, and democratic approaches to political development. Each country is used as an example. *Prereq.* 22.355 or *equiv.*

22.358 Government and Politics of Southeast Asia (3 q.h.)

A study of political instability and problems of establishing democratic structures and processes in the Philippines, Thailand, and India. *Prereq.* 22.329 or *equiv.*

22.359 Government and Politics of Japan (3 q.h.)

The historical development of the Japanese nation, with particular attention to the growth of fascism and efforts to create a viable democracy since World War II.

22.360 Politics and Policies of the Developing Nations 1 (3 q.h.)

Colonialism and the struggles for independence are discussed, and the common problems of developing nations are analyzed. Topics may include economic development, urbanization, cultural fragmentation, and revolution. *Prereq.* 22.329 or *equiv.*

22.361 Politics and Policies of the Developing Nations 2 (3 q.h.)

Based on the foundation provided in 22.360. Deals with efforts of developing countries to achieve rapid social, economic, and political modernization. The frequency of military takeovers and the prevalence of corrupt, inefficient government bureaucracies are discussed. The democratic and authoritarian avenues toward development are compared and evaluated. *Prereq.* 22.360 or *equiv.*

22.362 Government and Politics of Sub-Saharan Africa (3 q.h.)

Comparative analysis of political culture, organization, and behavior of African states south of the Sahara. *Prereq.* 22.329 or *equiv.*

22.363 Government and Politics of Northern Africa (3 q.h.)

Comparative analysis of political culture, organization, and behavior of African states north of the Sahara, with emphasis on Morocco, Algeria, Tunisia, and Egypt. *Prereq.* 22.329 or *equiv.*

22.364 Communism in Eastern Europe 1 (3 q.h.)

Conditions and circumstances surrounding the establishment of Communist regimes in Eastern Europe immediately after the Second World War, and their relations with the Soviet Union. *Prereq.* 22.329 or *equiv.*

22.365 Communism in Eastern Europe 2 (3 q.h.)

A continuation of 22.364. A study of nationalism, popular revolt, and socio-economic change in the 1950s and 1960s; the changing role of the Soviet Union in bloc affairs and the development of polycentrism. *Prereq.* 22.364 or *equiv.*

22.370 Consumer Advocacy 1 (3 q.h.)

A pragmatic course designed to define and expand the role of consumers in the marketplace. It is intended to focus upon consumer issues confronting us daily, so that individuals may deal with them intelligently and effectively. While not designed to make students "consumer-lawyers," it will touch upon legal as well as social, economic, and political aspects of consumer problems.

22.371 Consumer Advocacy 2 (3 q.h.)

A continuation of 22.370. *Prereq.* 22.370 or *equiv.*

22.372 Consumer Advocacy 3 (3 q.h.)

A continuation of 22.371. *Prereq.* 22.371 or *equiv.*

22.391 Honors Program 1 (4 q.h.)

Prereq. *Approval of the Dean.*

22.392 Honors Program 2 (4 q.h.)

Prereq. 22.391.

22.393 Honors Program 3 (4 q.h.)

Prereq. 22.392.

22.401 Introduction to Political Science 1 (4 q.h.)

Basic political concepts and forces of organization from the classical Greeks to the modern nation-state. The Soviet Union and the United Kingdom are contrasted as contemporary illustrations of the institutional distinction between a totalitarian and a constitutional system.

22.402 Introduction to Political Science 2 (4 q.h.)

The development of operational liberty in the United States and its constitutional underpinnings are considered, together with an analysis of the national American political process and the conduct of recent American foreign relations.

22.406 Organizational Theory (3 q.h.)

Deals with people and organizations and focuses on organizational and societal problems as a way of understanding how we can survive in a bureaucratic system.

22.491 Directed Study 1 (3 q.h.)

An opportunity for qualified students to take an upper-level course in their major area on an individual basis. Petitions and procedural instructions are available in the office of University College Social Science Programs, 204 Churchill Hall, 617-437-2416. *Prereq.* 87 q.h.

22.492 Directed Study 2 (3 q.h.)

An opportunity to initiate a second individual study as described above. *Prereq.* 22.491.

23: History

Consultant: Raymond H. Robinson, Chairman, Department of History (College of Arts and Sciences)
Coordinator of Western Civilization and Adviser to History Majors: Gerald H. Herman, Department of History (College of Arts and Sciences)

23.300 The Historian's Craft (3 q.h.)

The ways in which the historian studies the past, with emphasis on research and writing.

23.301 History of Civilization 1 (3 q.h.)

A worldwide overview of the development of human institutions from evolution through the end of the European Middle Ages. Emphasis generally will be placed on the continuities and changes that occur within civilizations and on the similarities, differences, and relationships that exist among contemporary civilizations around the world. Taught with a view to drawing out the implications of each historical period for our lives today.

23.302 History of Civilization 2 (3 q.h.)

The age of transition to the early modern world, emphasizing the intellectual, technological, and political expansion of Europe and the reactions of the rest of the world to that expansion. Special attention generally will be given to such topics as the rise of dynastic states, the rise and fall of mercantilism, the scientific revolution, exploration and gunpowder technology, and order and revolution. The period is from the end of the European Middle Ages to the coming of the French Revolution in 1789.

23.303 History of Civilization 3 (3 q.h.)

The modern world from 1789 to the present. Topics usually include capitalism and industrialization, nationalism and imperialism, the clash of ideologies in the nineteenth century, and a study of total war in the present century. Based on this historical study, the prospects for the future will be explored.

23.304 American History 1 (3 q.h.)

America from 1763 to 1848, with attention to the development of political, economic, and social institutions in the new republic.

23.305 American History 2 (3 q.h.)

The United States from 1848 to 1917, with attention to the coming of the Civil War, economic development thereafter, and the Progressive Era.

23.306 American History 3 (3 q.h.)

The United States since 1917, an age of urbanized industrialism and international involvement and crisis.

23.309 History of Civilization A (4 q.h.)

The major ideas and institutions of civilization from ancient times to 1648. (Not open to students who intend to receive credit for 23.301 and/or 23.302.)

23.310 History of Civilization B (4 q.h.)

A continuation of 23.309, covering the period since 1648. (Not open to students who intend to receive credit for 23.302 and/or 23.303.)

23.319 Health and Sickness: Historical Perspectives (3 q.h.)

A survey of medical theories from ancient times to the present, emphasizing concepts of disease causation and the health care systems or institutions derived from them. Medical theory and practice are related to both the general history of the period and the particular political, economic, or social circumstances that influenced attitudes regarding health care.

23.320 Population in History (3 q.h.)

An application of the principles of demography to European history from Roman times to the present.

23.321 Ancient Middle East (3 q.h.)

A study of ancient cultures and peoples in the Middle East to the rise of Islam.

23.322 Ancient Greece (3 q.h.)

The origin and development of Greek civilization.

23.323 Ancient Rome (3 q.h.)

Roman civilization in ancient times, with emphasis on the rise of the Republic and the decline of the Empire.

23.324 European Social and Economic History to 1000 (3 q.h.)

The development of society and the economy in ancient Greece and Rome and in the early Middle Ages. Topics include the rise of Christianity and the origin and growth of feudalism and manorialism.

23.325 European Social and Economic History, 1000-1648 (3 q.h.)

The development of society and the economy in the late Middle Ages and in early modern times. Topics include the decline of feudalism and manorialism, the rise of capitalism, the Reformation, and the Renaissance.

23.331 Islamic History (3 q.h.)

The history of the Muslim Arab world from the seventh century to the end of the Abbasid Caliphate in 1258.

23.332 Ottoman History (3 q.h.)

A study of the rise, glory, decay, and attempts at reform in the Ottoman Empire from the thirteenth century to World War I.

23.333 History of the Jews 1 (3 q.h.)

A survey of the Jews from the end of antiquity to early modern times from a cultural and intellectual perspective.

23.334 History of the Jews 2 (3 q.h.)

The role and position of the Jews in modern history.

23.335 Modern Middle East (3 q.h.)

The Middle East since 1914, with attention to Zionism, Pan Arabism, the effects of two world wars, and the postwar settlements.

23.336 History of Eastern Europe 1 (3 q.h.)

Prepolitical Slavic peoples on the eve of the fall of the Roman Empire; Christianity from Rome and from Constantinople and the Kingdom of Moravia; the genesis of Poland and the western Slavs and their relationship with Kievan Russia and the eastern Slavs. The decline of Bulgaria and the rise of Hungary; the Polish-Lithuanian Union of 1386 and the origin of the isolation of Russia from western Europe; the Knights of the Teutonic Order and the secularization of Prussia; the Ottoman advance into eastern Europe.

23.337 History of Eastern Europe 2 (3 q.h.)

Stefan Bathory and papal interest in Orthodox Russia; Western interference in Russia's "Time of Troubles"; Swedish invasions and the Northern War; the decline of Poland through Stanislaw Poniatowski and Czarina Catherine the Great of Russia. The partitions of Poland and Tadeusz Kosciuszko; Napoleon; revolutionary movements through 1848; Slavic romantic revolutionaries and the *fin de siecle*. World War I and the Reconstruction of Eastern Europe. Hitler, Stalin, and World War II. The "Iron Curtain."

23.339 European Intellectual History since 1815 (3 q.h.)

The main currents of European thought considered in their social and political contexts from Romanticism to the present.

23.346 Europe, 1870-1921 (3 q.h.)

The background of World War I—nationalism, militarism, imperialism, the alliance system—and the making of war and peace.

23.347 Europe since 1921 (3 q.h.)

Europe between the wars; World War II; the Cold War; efforts to unify the continent.

23.357 Ireland since 1800 (3 q.h.)

A study of the Irish question in British politics from the Act of Union to the present.

23.360 American Indians (3 q.h.)

A survey of native Americans from pre-Columbian times to the present.

23.361 Colonial America (3 q.h.)

The exploration and settlement of North America; the development of political, social, and economic institutions; international rivalry to 1763.

23.363 The American Revolution (3 q.h.)

British-American relations after 1763; war and peace.

23.366 The Growth of American Government (3 q.h.)

Analysis of the change in government's functions, size, cost, and impact, with primary chronological focus on the twentieth century.

23.368 American Social History (3 q.h.)

Selected topics in the development of the capitalist economy in America, with attention to the role of government since 1789.

23.369 American Economic History (3 q.h.)

Selected topics in the development of the capitalist economy in America, with attention to the role of government since 1789.

23.372 Boston to 1822 (3 q.h.)

The town of Boston from its establishment in 1630; the development of political, economic, and social institutions.

23.373 Boston since 1822 (3 q.h.)

The city of Boston, annexations, changes in the ethnic nature of the people.

23.374 African-American History (3 q.h.)

The history of African-Americans from colonial times to the present.

23.378 The United States since 1945 (3 q.h.)

The American people from the close of World War II to the present.

23.379 History of Sport in America (3 q.h.)

A history of the major sports and their impact on American life.

23.383 Contemporary Latin America (3 q.h.)

The social, economic, and political development of the Latin American republics in the twentieth century.

23.385 China since 1850 (3 q.h.)

A century of China's history, with emphasis on the Western impact on Chinese civilization, China's struggle to maintain independence, and the victory of communism in the mid-twentieth century.

23.386 Japan since 1850 (3 q.h.)

An analysis of Japanese domestic developments and foreign relations since the mid-nineteenth century.

23.389 Africa since 1885 (3 q.h.)

The European impact on Africa, the rise of African nationalism, the emergence of independent African states, their relations with other nations.

23.396 Russia since 1917 (3 q.h.)

The revolutions of 1917 and the subsequent history of the Russian people and government, with special emphasis on foreign relations.

23.397 Honors Program 1 (4 q.h.)

Prereq. Approval of the Dean.

23.398 Honors Program 2 (4 q.h.)

Prereq. 23.397.

23.399 Honors Program 3 (4 q.h.)

Prereq. 23.398.

23.400 Oral History (3 q.h.)

Learning history from those who lived it. Students conduct tape-recorded interviews about a selected aspect of twentieth-century history from first-hand experience. Students need access to audio tape recorders.

23.403 History of the Professions (3 q.h.)

The evolution of the classic professions of law and medicine in the nineteenth century, and a study of the emergence of new professions such as engineering, nursing, accounting, and social work. Themes include professional-client, professional-employer, and professional-government relations as well as education, professional organizations, and sex stereotyping.

23.405 History of Criminal Justice in America (3 q.h.)

The evolution of the criminal justice system in the United States, with special emphasis on the impact of English common law, the changing role of law enforcement officers, reform movements, the female offender, the black experience, and the changing meaning of law and order in the United States.

23.406 History of the Automobile (3 q.h.)

The history of the automobile in Europe and America. Topics include invention, production, impact on social and economic life, and problems of pollution and energy.

23.407 Technological Transformation of Society (3 q.h.)

The relation between technological innovations and the world in which they take place. Discussion of conditions necessary for discovery and innovation. Impact of technology on political, economic, and social environment.

23.408 History of Energy (3 q.h.)

The history of the methods by which human beings have mobilized the forces of nature to survive, to alter and improve their lifestyles, and to dominate their fellow human beings. Emphasis is placed on the points of transformation from one energy source to the available alternatives, and the reasons for the choices made. Topics include the change from manpower to animal and machine power, the energy crisis of the sixteenth century, and the transformation from wood to water and coal power, the rise of electricity and fossil fuels, the birth of the Atomic Age, and the contemporary history of the oil crisis.

23.409 Third World Women (3 q.h.)

An exploration of the role of women in the less developed third world areas, with special emphasis on factors of change, development, and continuity.

23.410 Family History (3 q.h.)

The history of the family in Europe and America from 1600 to the present. Topics include the changing nature and role of the family, marriage and divorce, child rearing, and aging.

23.411 Hitler's Germany (3 q.h.)

A study of the origins and nature of Hitler's Third Reich, emphasizing the personal lives of Nazi leaders in an attempt to understand how seemingly ordinary people could enthusiastically promote wars of aggression and revel in genocidal policies.

23.412 European Colonialism (3 q.h.)

The building of colonial empires by European nations after 1500, with attention to exploration and conquest, colonial administration, and the movements toward independence.

23.413 Russian Expansionism (3 q.h.)

Russia's quest for territory after 1500, with attention to the conquest of neighboring territories, the Sino-Russian disputes, and current issues in Soviet geopolitics.

23.414 American Expansionism (3 q.h.)

A study of territorial expansion of the United States after independence, with attention to the forces leading to acquisition, the methods of acquiring property, and the consequences of expansionism.

23.415 History of Flight and Space (3 q.h.)

Beginning with the dreams of flight of the ancient Greeks and Leonardo da Vinci, the course will trace the history of nonpowered flight from the balloon experiments of the Montgolfier brothers to contemporary hang-gliders, powered flight from the Wright brothers through the supersonic transport, and rocketry and space travel from its earliest beginnings through *Enterprise*.

23.491 Directed Study 1 (3 q.h.)

An opportunity for qualified students to take an upper-level course in their major area on an individual basis. Petitions and procedural instructions are available in the office of University College Social Science Programs, 204 Churchill Hall, 617-437-2416. *Prereq.* 87 q.h.

23.492 Directed Study 2 (3 q.h.)

An opportunity to initiate a second individual study as described above. *Prereq.* 23.491.

23.499 Field Work in History (6 q.h.)

Extracollegiate experience in historical research or historical agencies. (Refer to page 69 for general description of field work courses.) *Prereq.* Survey courses in *World Civilization*, *American History*, and *The Historian's Craft*.

25: Social Welfare (see page 154.)**26: Philosophy and Religion**

Consultant: Prof. E. Hacker, Philosophy Dept. (College of Arts and Sciences)

26.301 Philosophy: Methods and Values (3 q.h.)

Introduces the student to the methods and values of thinking philosophically. The strategies of dialogue and of informational discovery are revealed through understanding and use of the Socratic method of intellectual exchange. In analyzing the universal quest for truth, the student begins to distinguish between knowing and not knowing, dogma and ignorance. Value issues are probed through questions in ethics and moral philosophy.

26.302 Philosophy of Knowing and Reality (3 q.h.)

Students probe distinct and relative issues to provide a basis for individual reflection about the difference between knowledge and belief. Areas of theoretical focus include the nature of ultimate reality, the nature of human knowledge, and the nature and existence of God. The investigation of a variety of problems and alternative solutions helps students to think independently and self-critically. Stress is given to the development of discipline and precision in communicating ideas.

26.303 Philosophy of Right and Justice (3 q.h.)

Focus is on ethics and social and political philosophy. In ethics the two basic questions to be addressed are: What sort of things are good or bad? and What actions are right or wrong? Social and political philosophy examines the theories of human nature, social change, social institutions, and major twentieth-century political theories. Additional topics such as aesthetics and philosophy of history may be discussed.

26.309 Major Thinkers of Our Time (3 q.h.)

A study of two or three philosophers, representative of which would be Austin, Ayer, Carnap, Dewey, Lewis, Maritain, Moore, Russell, or Whitehead. *Prereq.* 26.310

26.310 Introduction to Philosophy (Intensive) (9 q.h.)

Same as 26.301, 26.302, and 26.303.

26.314 The Human Search for Meaning (3 q.h.)

A philosophical and literary study of the nature of man. What is human nature? What is a human being? Various philosophical answers have been given to these questions. These viewpoints will be examined with special attention to the significance of convention and tradition, social role, and freedom and decision.

26.315 Images of Man in Philosophy (3 q.h.)

A philosophical and literary study of the nature of man. What is human nature? What is a human being? Various philosophical answers have been given to these questions. These viewpoints will be examined with special attention to the significance of convention and tradition, social role, and freedom and decision.

26.320 The Great Eastern Religions (3 q.h.)

A study of the basic teachings of Taoism, Confucianism, Buddhism, Hinduism, and Shintoism.

26.321 The Great Western Religions (3 q.h.)

A study of the basic teachings of Judaism, Christianity, and Islam.

26.322 Understanding Religion in America Today (3 q.h.)

The primary focus of this course deals with the major religious expressions in America today. Topics for discussion include such contemporary issues as creationism, abortion, homosexuality, celibacy, and the right to die. Guest speakers representing new movements within established religions, as well as sects and cults, will be featured.

26.331 Ethics 1 (3 q.h.)

Analysis and criticism of moral argument. How to recognize areas of moral agreement and disagreement. Introduction to major moral viewpoints and their application to specific situations.

26.332 Ethics 2 (3 q.h.)

Problems and issues encountered in important areas of moral concern, such as euthanasia, punishment, and moral responsibility. Various approaches to these problems may be explained, as related to basic moral viewpoints. *Prereq.* 26.331.

26.333 Ethics 3 (3 q.h.)

Issues and viewpoints concerning human nature and its relevance to morality, leading to examination of such topics as victimless wrongs and the relation between morality and the law. *Prereq.* 26.332.

26.334 Introduction to Logic (3 q.h.)

The essentials of lucid thinking are explained in terms of basic logical concepts: deductive and inductive reasoning, valid and invalid arguments, the varied functions of language and definition. The student is given the opportunity to recognize and evaluate different kinds of arguments and methods of detecting and avoiding common errors in reasoning. The link between structured thought and effective communication is shown.

26.336 Business Ethics (3 q.h.)

Examination of ethical principles and considerations applicable to the moral decisions facing a businessperson. Basic general ethical viewpoints are studied as a foundation. Specific characteristics of business life are studied, and particular cases and examples analyzed.

26.337 Philosophy of Professionalism (3 q.h.)

A philosophic analysis of professionalism as an aspect of individual life and as an element of society. Examines the defining characteristics of a profession as well as the questions that arise from the nature of a profession, the typical attitudes toward the professions, and the

ethical standards appropriate to the various professions.

26.344 Selected Topics in Philosophy 1 (3 q.h.)

Advanced course. Readings chosen jointly by students and instructor. Has included such topics as aggression, utopian literature, Marxism, and pragmatism.

26.345 Selected Topics in Philosophy 2 (3 q.h.)

Continuation of 26.344.

26.346 Selected Topics in Philosophy 3 (3 q.h.)

Continuation of 26.345.

26.351 The Existentialist Revolt (3 q.h.)

Sources of existentialism in the Western tradition, with emphasis upon Kierkegaard and Nietzsche.

26.352 The Existentialist Challenge (3 q.h.)

The existential view of man and his world, with emphasis upon Heidegger, Sartre, and the religious existentialists—Marcel, Tillich, and Buber. *Prereq.* 26.351.

26.353 Existentialism Appraised (3 q.h.)

Contemporary assessments of the existentialist movement, its meaning, significance, and truth. *Prereq.* 26.352.

26.360. Buddhism (3 q.h.)

The principle teachings of the Buddhists.

26.361 Hinduism (3 q.h.)

The major Hindu teachings.

26.362 Islam (3 q.h.)

The major principles of Islam.

26.363 Judaism (3 q.h.)

The elements of Judaism.

26.367 Mysticism: East and West (3 q.h.)

An exploration of mystical experiences through a discussion of some representative religious mystics.

26.371 Inductive Logic and Scientific Method (3 q.h.)

The study of inductive logic. Emphasis is on evaluation of generalizations, problems in "weighing the evidence," and common errors in inductive reasoning. Also studied are Mill's methods of experimental inquiry and common errors in casual reasoning.

26.372 Introduction to Symbolic Logic (3 q.h.)

An introduction to the fundamentals of propositional logic. Toward the end of the quarter, the notation of the logic of quantifiers is introduced.

26.373 Philosophy of Religion (3 q.h.)

A study and evaluation of the arguments for the existence of God. Also studies natural and moral evil, the soul, immortality, the evidence for miracles, and the nature of religious knowledge.

26.374 Theistic, Atheistic, and Agnostic Philosophies (3 q.h.)

A comparative and evaluative study of selected theistic, atheistic, and agnostic philosophies. Some of the questions studied are: Is the belief in God necessary for a comprehensive philosophy of life? How does an atheistic philosophy explain and justify the "higher values" such as love, beauty, justice, etc.? How is it possible to base a philosophy on the principle of agnosticism?

26.376 The Meaning of Death (3 q.h.)

Various philosophical and religious views concerning the meaning of death. Some of the questions discussed are: What attitude should one take regarding one's own death? What role does death play in our personal relations to others? Is a belief in an afterlife necessary in order to give meaning to this life?

26.377 Philosophy of Consciousness (3 q.h.)

An exploration of the theories of consciousness and the possibility of higher states of consciousness. Readings may include some of the psychological and parapsychological literature on the subject. Also explored will be some of the techniques (meditation, etc.) that are alleged to lead to higher states of consciousness.

26.378 Unorthodox Philosophies (3 q.h.)

A study of some current groups in Western culture whose philosophical and psychological teachings would be regarded as unorthodox by most experts in these areas. Some of the groups studied are: Scientology Society, International Meditation Society, Ouspensky-Gurdjieff Centers.

26.381 Philosophy of Art (3 q.h.)

An investigation into the nature of art and the experience of beauty. The aesthetic theories of Plato, Aristotle, Tolstoy, Kant, Dewey, and others are critically compared. Also studied are the problems of artistic taste, standards of criticism, and the objectivity of artistic judgments.

26.382 Images of Woman in Philosophy (3 q.h.)

A philosophical approach to the study of woman in society. Drawing from the sources within the history of philosophy and literature, topics include: the role of women in society (ideal and actual), love and marriage, oppression and isolation, and the cult of virginity.

26.383 Philosophy of Education (3 q.h.)

A study of contrasting theories of education. Questions examined are: What should be the goal of education? Can and should cultural values be taught? What are the values of a liberal arts education in a technical society? What is an ideal curriculum for the accomplishment of a given educational goal?

26.384 Philosophy of Medicine (3 q.h.)

Social and moral problems created by medical science. Questions investigated are: Should a human life be prolonged under any condition and at any cost? What are the moral problems caused by the current medical def-

initions of death? Is it morally right to predetermine the physical characteristics of future generations by genetic engineering?

26.385 Social Philosophy (3 q.h.)

Critical examination of the leading socio-political ideologies in regard to their conceptions of the character, structure, and function of society.

26.386 Political Philosophy: Right vs. Left (3 q.h.)

An examination of the political philosophies underlying conservatism, liberalism, and radicalism. Emphasis will be on contemporary political trends.

26.387 Dialectical Materialism: The Philosophy of Marxism (3 q.h.)

A study of the philosophical aspects of Marxism. Some attention will be given to Marx's view of society, history, economics, and ethics.

26.388 Philosophy of History (3 q.h.)

Emphasis will be given to the speculative philosophy of history, that is, the attempt to discover some general pattern in the history of mankind. Some of the philosophers studied are: Hegel, Marx, Spengler, and Toynbee.

26.389 Philosophy of Contemporary Social Criticism (3 q.h.)

A critical study of contemporary society and its institutions. Readings may include selections from the works of Paul Goodman, Lewis Mumford, and Eric Fromm.

26.390 Philosophy of the Social Sciences (3 q.h.)

An examination and evaluation of the methodologies of the social sciences: sociology, psychology, history, political science, and economics. Some of the issues examined are: prediction and explanation in the social sciences, a comparison of the methodologies of the social and physical sciences, experimentation and verification in the social sciences.

27: Arts

Consultant: Prof. Samuel S. Bishop, Art Dept. (College of Arts and Sciences)

Lab Fee—*Some photography courses listed below require a lab fee, in which case it is noted in the course description. Other studio courses may require a lab fee, in which case the student will be informed at the first class meeting. For lab fee rates, see page 38.*

A. Fine Arts

27.301 Introduction to Art (3 q.h.)

Introduction to the language, techniques, aesthetics, and visual styles of paintings, sculpture, graphic arts, and architecture. Will include individual and comparative studies of major works of art in each field; discussion of terminology; and examination of the social, political, and cultural significance of each art form historically. Slide lectures and discussions.

27.304 History of Art* (formerly History of Art I) (3 q.h.)
History of Western art from prehistoric times to the end of the Roman Empire. Will include the study of major monuments, artists, and stylistic developments that have evolved during the prehistoric, primitive, Egyptian, Mesopotamian, Aegean, Greek, and Roman periods. Slide lectures and discussion.

27.305 History of Art to the Sixteenth Century*
(formerly History of Art II) (3 q.h.)

History of Western art from the end of the Roman Empire to the late sixteenth century. Will include the study of major monuments, artists, and stylistic developments that have evolved during the Early Christian, Byzantine, Early Medieval, Romanesque, Gothic, Early and High Renaissance, and late sixteenth-century Mannerist periods, and such artists as Michelangelo, da Vinci, and Raphael. Slide lectures and discussion.

27.306 History of Art to the Twentieth Century*
(formerly History of Art III) (3 q.h.)

History of Western art from the late sixteenth century to the twentieth century. Will include the study of major monuments, artists, and stylistic developments that evolved during Baroque, Rococo, and nineteenth-century Europe (such as Renoir, Monet, and the Impressionists), America (such as Winston and Home), and twentieth-century Europe (such as Matisse and Picasso) and America (such as O'Keefe, Pollack, and Wyeth). Slide lectures and discussions.

27.307* Latin American Art (formerly 27.336) (3 q.h.)

A survey of the development of architecture, sculpture, painting, and the decorative arts in Latin America from the pre-Columbian period to the present. Will include the study of the classic Maya and Toltec Maya of Central America and Mexico; the Aztecs of Mexico; the Mochica, Masca, Tiahuanaco, Chimu, and Incas of South America; and the rise of national artistic directions in modern Latin America.

27.308* Mexican Art (formerly 27.403) (3 q.h.)

A study of Mexican art from the archaic and classical periods of pre-Columbian art to the present. Will include the Olmec, northern Maya, Toltec, and Aztec periods; the influence of Cortez and the Spaniards; the monumental social realism of Siqueiros, Rivera, and Orozco. Slide lectures and assigned readings.

27.309* American Indian Art (formerly 27.410) (3 q.h.)

A survey of American Indian architecture, painting, sculpture, and the minor arts and crafts from pre-Columbian cultures to the present. Will include the arts of Meso-American, the American Southwest, the Plains, the Northwest Coast, and the Eastern United States. Slide lectures and assigned readings.

27.310 Women in Art and Women Artists (3 q.h.)

A study of women in the arts from prehistoric times to the present. Focus on the role of women as symbols, religious figures, erotic objects, and idealized images

of femininity. Examples include fertility images, venus images, madonnas, portraits, and genre works. Examination of the historical role of women as artists.

27.313 Introduction to the Great Museums of Europe (3 q.h.)

Designed to introduce students to the great museums of Europe and their collections. Through a slide lecture format, the student will be introduced to the museums, their settings, and important examples from their collections. Museums that will be explored include the Egyptian Museum, Cairo; the National Museum, Athens; the Uffizzi and Pitti Museums, Florence; the Prado, Madrid; the Louvre, Paris; and the National Gallery, London.

27.315 Modern Painting* (formerly Modern Painting 1) (3 q.h.)

A study of developments in painting from the late nineteenth century through the early 1930s. Will include an examination of major schools, movements, and artists from post-impressionism through surrealism (such as van Gogh, Cezanne, and Dali). Focus will be on important shifts in painting concepts and the rise of innovative modes of expression instrumental in establishing the foundation of modernism.

27.316 Contemporary Painting* (formerly Modern Painting 2) (3 q.h.)

A study of developments in painting from the early 1930s to the present—major schools, movements, and artists. Focus will be on the cultural impact of the exodus of artists from Europe and their settlement in the United States prior to World War II; the meteoric rise of abstract expressionism and its international influence; and the rise of a diversity of movements, such as pop art, minimalism, conceptual art, and new realism, since World War II.

27.320 Italian Renaissance Art (3 q.h.)

A study of Italian painting, sculpture, and architecture of the fifteenth and sixteenth centuries, with special attention to their historical, cultural, and social contexts. Examination of the foundation of Renaissance ideals as reflected in a renewed interest in classical concepts of harmony and order and a new sense of self-awareness, individualism, and naturalism. In-depth study examines such artists as Giotto, Donatello, Botticelli, Michelangelo, da Vinci, Raphael, and Titian.

27.322 French Painting (3 q.h.)

A study of the development of French painting from the French Revolution up through the nineteenth century. Will include an examination of neoclassicism, romanticism, realism, impressionism, and post-impressionism, with a focus on such figures as: David, Delacroix, Courbet, Manet, Degas, Monet, Renoir, Cezanne, and van Gogh. Will also include study of the French interest in the formal problems of painting and the painting process as distinct from its narrative content.

27.324 American Painting and Sculpture* (formerly American Art 1) (3 q.h.)

A survey of American painting and sculpture from colonial times through the early 1930s. Will include the study of painting from itinerant colonial "limmers" through Copley, Benjamin West and the English tradition, the Hudson River school, Eakins, Hopper, Marin, Stella, O'Keefe, and the founding of American modernist painting. Will also include a study of sculpture from colonial gravestone reliefs through Rush, Augur, and the public monuments of French and Saint-Gaudens. The course will end with Calder.

27.325 American Architecture* (formerly American Art 2) (3 q.h.)

A survey of American architecture from the colonial period up through the early 1930s. Will include the study of the seventeenth-century Early American style, the eighteenth-century Georgian style, the Republican style, mid-nineteenth-century period revival styles, the stick-and-shingle styles, Richardsonianism, Sullivan and the rise of the skyscraper, and Frank Lloyd Wright.

27.326 Twentieth-Century Architecture* (formerly American Art 3 and Twentieth-Century American and European Architecture) (3 q.h.)

A study of European and American architecture of the twentieth century. Will include an examination of Gropius's Bauhaus tenets concerning housing, urban planning, and utilitarian mass production; Mies van der Rohe, Le Corbusier, and the International style; Frank Lloyd Wright; and the foundation of American architectural modernism as exemplified by Neutra, Johnson, Saarinen, and Buckminster Fuller.

27.338 Chinese Painting (3 q.h.)

Will include work from the Ch'in and Han dynasties; the period of the Three Kingdoms; the Tang dynasty; the Five Dynasties and Northern Sung; the Southern Sung, the Yuan, Ming, and Ch'ing dynasties; as well as more recent developments of the twentieth century.

27.339 Japanese Art (3 q.h.)

A study of the development of Japanese painting, sculpture, and architecture from its inception through the twentieth century. Will include work from the Jomon period, the Suiko style, the Tang style (Nara and Early Heian), the Shinto shrines period, the Later Heian period, the Kamakura period, the Ashikaga period, the Momoyama period, as well as the work of more recent artists such as Hokusai and Hiroshige.

27.341 Principles of Drawing and Composition* (formerly Drawing) (3 q.h.)

Introduction to the fundamental principles of drawing and composition through formal graphic studies of line, shape, value, form, light, space, pattern, and texture. Use of pencil, charcoal, conte crayon, and other dry media will be stressed. Slide lectures and critiques as needed.

27.342 Introduction to Figure Drawing* (formerly Color Drawing) (3 q.h.)

An introductory studio course in drawing the human form. Includes basic studies in anatomy, proportion, negative/positive space, contour, gesture, mass, line, composition, and drawing technique. Slide lectures, critiques, and weekly sessions drawing from the model.

27.343 Drawing Workshop* (formerly Figure Drawing) (3 q.h.)

Introduction to more advanced problems in the analysis of visual language and its creative organization. Will include some location drawings and the creation of original compositions. Emphasis will be placed on strengthening drawing techniques and encouraging the development of a personal style.

27.344 Printmaking—Relief* (formerly Graphic Arts—Woodcutting) (3 q.h.)

A fundamental course in the production of prints using the relief process. Will include woodcut techniques, linoleum and block cut techniques, as well as other relief print techniques. Will explore paper stocks, inks, carving techniques, and printing techniques.

27.345 Printmaking—Silkscreen* (formerly Graphic Arts—Silkscreen) (3 q.h.)

A fundamental course in the production of prints using the stencil process. Will include the technique of the hand-cut film, brushed paper and blockouts, multi-color printing and registration, selections of inks and papers, stretching and preparing a screen.

27.346 Printmaking—Intaglio* (formerly Graphic Arts—Etching) (3 q.h.)

A fundamental course in the production of prints using the intaglio process. Will include etching, aquatint, dry point, engraving, sugar-lift, and other intaglio techniques. Focus will be on drawing and design skills and on understanding the printmaking craft.

27.350 Figure Drawing Workshop (3 q.h.)

Studio exploration of formal problems in anatomy and drawing the human form. Will include the study of understructure in figure drawing; gesture; figure composition; expressive use of line, value, and scale; and development of strong drawing technique. Emphasis will be placed on creating a personal drawing style.

27.351 Basic Painting* (formerly Painting—Basic Level) (3 q.h.)

An introduction to the fundamentals of painting. Formal studio assignments in the study of color, light, planar space systems, form, texture, and composition to establish a foundation for more individual, creative expression. Critiques and slide lectures as needed.

27.352 Intermediate Painting* (formerly Painting—Figure) (3 q.h.)

A brief review of the fundamental principles of painting, followed by more advanced studies in shape, scale, texture, brushstroke, and edge, as well as color, light,

form, and composition. Problems in a variety of stylistic approaches and techniques, from both the past and present. Critiques and slide lectures as needed.

27.353 Painting Workshop* (formerly Painting—Composition) (3 q.h.)

Emphasis will be on individual development within the framework of a structured, project-oriented approach. Recognition of the conceptual aspects of painting and development of a personal painting style and unique visual imagery will be encouraged. Critiques and slide lectures as needed.

27.361 Basic Color and Design* (formerly Basic Color and Design I) (3 q.h.)

An introduction of the principles of design and the science and art of color. Individual projects involve the student in perceiving, simplifying, and organizing basic images as structured form and space and in understanding the nature and properties of color and its expressive potential.

27.362 Color and Design Practice* (formerly Basic Color and Design II) (3 q.h.)

Intermediate-level problems in the aesthetic organization of color and design elements. Students will explore the expressive possibilities in color orchestration, color harmonies, light as color, and the spatial characteristics of color.

27.363 Contemporary Design* (formerly Basic Color and Design III) (3 q.h.)

Advanced workshop approach to color and design. Focus will be on individual solutions to specific color and design problems. Comparative studies of effective use of color and design in contemporary art.

27.375 Basic Watercolor Painting* (formerly Watercolor Painting I) (3 q.h.)

Practice and creative expression in the technical fundamentals of watercolor.

27.376 Watercolor Painting Practice* (formerly Watercolor Painting II) (3 q.h.)

Creative expression in various techniques of watercolor. *Prereq.* 27.375.

27.377 Techniques of Watercolor Painting* (formerly Watercolor Painting III) (3 q.h.)

Advanced expression in watercolor. *Prereq.* 27.376.

27.387 History of Photography* (combines former 27.387 History of Photography and 27.388 History of Photography to the Twentieth Century) (3 q.h.)

A survey of developments in photography from the early daguerreotypes to the present. Major movements, styles, artists, and significant technological developments will be analyzed and discussed. Slide lectures and assigned readings.

27.389 Contemporary Photography (3 q.h.)

A study of styles and techniques that have evolved in contemporary photography since World War II. Empha-

sis will be placed on the variety of image-making techniques and photographic styles and concepts that emerged in the last twenty years. Slide lectures and assigned readings.

27.392 New York Art Seminar (3 q.h.)

Study and observation of the painting collections in the Metropolitan Museum of Art, Frick Collection, Museum of Modern Art, and the Guggenheim Museum.

27.393 The Arts in Boston (3 q.h.)

An examination of the arts in Boston, such as painting, sculpture, and architecture. Lectures, discussions, tours, and field trips.

27.394 European Art Seminar (3 q.h.)

A four-week study and travel seminar through major European art centers, with emphasis on the major works of art in each.

27.395 Directed Study (3 q.h.)

An opportunity for qualified students to take an upper-level required course when the needed course is not available at the time recommended in the degree scheduling sequence. Petitions and procedural instructions are available in 204 Churchill Hall. *Allow at least six weeks to complete petition process. Prereq.* 87 q.h.

27.396 Directed Study 2 (3 q.h.)

An opportunity to initiate a second individual study as described above. *Prereq.* 27.395.

27.400 Honors Program 1 (4 q.h.)

Prereq. Approval of the Dean.

27.401 Honors Program 2 (4 q.h.)

Prereq. 27.400.

27.402 Honors Program 3 (4 q.h.)

Prereq. 27.401.

B. Media and Graphic Communication

27.420 Graphic Communication and Production (3 q.h.)

Introduction to the wide range of graphics and technical illustration available and how to use them. Students have the opportunity to learn effective techniques of integrating graphic and written communication, as well as which pitfalls to avoid. An overview of the production process includes an introduction to lithography, screening, color techniques, composition, process camera, paper stocks, bindery methods, and economic factors.

27.421 Design and Production of Promotional Publications (3 q.h.)

Study of the design, function, and economics of producing promotional publications. Focus on the distinction between promotional and technical literature and their differences in objective and audience. Examines problems in product brochure design, marketing, ad-

vertising, sales support literature, and trade show and sales graphics.

27.422 Design and Production of Technical Publications (3 q.h.)

Study of the design, function, and economics of producing technical publications. Focus on the special requirements of technical literature, its objectives and intended audience. Examines problems in designing technical service manuals, operating guides, software documentation, and the appropriate use and function of schematics, block diagrams, line drawings, photographs, and other visuals.

27.425 Graphic Design 1* (formerly 27.371 Basic Commercial Design) (3 q.h.)

Introduction to professional problem solving in graphic design communications. Study and creative work in design principles and their application, color, visual expression, basic concepts of layout, layout techniques and tools, design and graphic symbols, creative use of typography, and correlation of graphic forms and organization with content in communicating ideas.

27.426 Graphic Design 2* (formerly 27.372 Commercial Design Practice) (3 q.h.)

Intermediate study and creative work in professional problem solving in graphic design communications. Emphasis will be placed on creating an overall design concept. Students will design public graphic systems, exhibit graphics, corporate graphics, and explore effective problem-solving techniques and concept development methodology.

27.427 Advertising Design* (formerly 27.373 Commercial Design Problems) (3 q.h.)

Introduction to the environment, language, and design problems commonly met in the advertising field. Study and creative work in advertising layout, tools and techniques, use of color, color printing processes, typography, layout and design, preparation and client presentations, and the design of a variety of advertising literature pieces.

27.428 Advanced Graphic Design* (formerly 27.374 Advanced Commercial Design) (3 q.h.)

Creative problems in illustrative design.

27.440 Basic Photography 1 (3 q.h.)

This course is intended to acquaint the beginning student with the camera, the negative, and the print. Weekly shooting assignments, demonstrations, and hands-on lab experience are part of this active, primary-level course. *Lab fee.*

27.441 Basic Photography 2 (3 q.h.)

A continuation of Basic Photography 1, with more emphasis on combining personal aesthetic choices with refining darkroom skills. A final portfolio at the end of the course, as well as weekly shooting assignments, is required. *Lab fee.*

27.442 Intermediate Photography Workshop (3 q.h.)

Through close interaction with the instructor, students are asked to refine their technical skills and to make meaningful decisions about their relation to the world around them through the use of photography. Alternative processes such as infrared, toners, and large format will be demonstrated and used. Contemporary trends in photography will be shown with frequent slide presentations. In short, a qualitative approach to substantive photography. *Lab fee. Prereq. 27.441 or equiv.*

28: Music

Consultant: Prof. Joshua R. Jacobson, Music Dept. (College of Arts and Sciences)

Adviser Coordinator: Edgar Weiss

A. Music History and Music Electives

28.301 Introduction to Music (3 q.h.)

Introduction to selected works of our musical heritage from earliest times to contemporary styles. Primarily a survey and listening course, with emphasis on styles, basic theory, forms, and the historical, social, and artistic periods these works represent.

28.302 How to Read and Write Music (3 q.h.)

Introduction to the basics of musical notation for students with little or no theory or performance background. The use of the symbols of pitch and duration is the main focus of the course. Activities include sight reading simple melodies, following scores, arranging music for small instrumental groups, transposition, and elementary rhythmic and melodic composition.

28.303 Women in Music (3 q.h.)

A study in depth of the historical role of women in music; woman as composer, performer, patron, inspiration.

28.305 Medieval and Renaissance (3 q.h.)

The course examines the development of sacred and secular monophony, vocal and instrumental works, and polyphonic music from their beginnings to about 1600.

28.306 Music of the Baroque (3 q.h.)

The course focuses on the period of the emergence of the orchestra, the chorus, and the virtuoso performer; the development of the oratorio, opera, concerto, and symphony in the works of such composers as Monteverdi, Corelli, Handel, Vivaldi, and J.S. Bach.

28.311 History of Musical Styles (3 q.h.)

A course for nonmusic majors. A survey of the historical trends in music from ancient times to the present. Individuals, ideas, and events that have influenced change in musical style will be highlighted. The student should gain a broad overview of musical literature and history, which will enhance understanding and future concert attendance.

28.312 Music of the Middle East (3 q.h.)

This course is an introduction to the music of selected Near Eastern and Arab cultures, such as Persian culture

in the East and Ethiopic and Berber cultures in Africa, as well as the traditional instruments of the areas. The cantillation styles and practices of various chants of the Hebrew, Christian, and Islamic traditions are also included.

28.313 Music of Africa (3 q.h.)

The music of Africa is as varied as its many linguistic and tribal identities. This course will provide a broad survey of the musical traditions of Africa and their historical, social, and cultural backgrounds, as well as an approach to musical organization, musical practice, and significant aspects of style. These will all be discussed in light of possible contributions to contemporary African-American music.

28.317 Music as a Means of Social Expression (3 q.h.)

Deals with the artist's involvement with the recurring social themes of human self-image, the search for peace and understanding, minority groups, and sexual relationships. Paintings and literary works are used, in addition to works by Beethoven, Schoenberg, Britten, and jazz composers.

28.321 The Symphony (3 q.h.)

A study of the symphony as the major genre in the classical, romantic, and contemporary periods. Works by Haydn, Mozart, Beethoven, Schumann, Tchaikovsky, Brahms, Sibelius.

28.324 The World of Opera (3 q.h.)

Analysis of opera as a dramatic form. Aria, recitative, ensemble, and other basic elements of opera are isolated and discussed. Numbers opera, music drama, and singspiel are some of the types of opera considered. Composers whose works are analyzed include Mozart, Wagner, Verdi, and Puccini.

28.326 Jazz: Evolution and Essence (3 q.h.)

Jazz from its origins in New Orleans to the avant-garde experiments of today. The rhythmic, harmonic, instrumental, and stylistic characteristics of jazz are analyzed. Attention is given to the works of creative jazz artists such as Armstrong, Beiderbecke, Parker, Ellington, and Coltrane.

28.331 Life and Works of J. S. Bach (3 q.h.)

The genius who summed up the Baroque era. A study of the man whose every note reflected his profoundly humanistic approach to religion. Works include large choral masterpieces such as the *St. Matthew Passion*, the *Brandenburg Concertos*, the *Well Tempered Clavier*, and the Suites.

28.332 Life and Works of Mozart (3 q.h.)

A musical development from child prodigy to mature artist is traced from his own letters and from biographies. Many of his major works, including opera, symphonies, concertos, and chamber music, are analyzed in detail.

28.333 Life and Works of Beethoven (3 q.h.)

An analysis of the complex personality and art of this major figure. His relation to the turbulent times in which he lived and his role in classical and romantic music.

28.342 Music U.S.A. (3 q.h.)

American music from Puritan psalm singing to the present. Folk music of ethnic origin, concert music, ragtime jazz, and contemporary styles are discussed.

28.343 Great Choral Literature (3 q.h.)

A study of sacred and secular choral literature from medieval to contemporary times.

28.354 European Music and Art (3 q.h.)

A comparative study of how the European composers used the works of art of Spanish, English, and German painters as inspiration for their individual musical scores. Analyzing many European museum paintings and their musical counterparts gives the student knowledge of the influence of the methods and works of art on the composition of these musicians.

28.358 Life and Works of Debussy (3 q.h.)

Claude Debussy, impressionist in sound, composed music that marked the turning point toward modern trends. Much of his music for piano, orchestra, and opera will be studied, including *Pour le Piano Suite*, *Suite Bergamasque* ("Clair de Lune"), *Images* for piano and orchestra, *Nocturnes*, *La Mer*, and the opera *Pelléas and Mélisande*.

28.361 Music in Popular Culture (3 q.h.)

Investigates the attitude of American civilization toward culture, art, and beauty through a look at contemporary popular music. Compares the different styles of pop music (jazz, rock, MOR, R&B) and traces their evolution. Examines the manipulation of public tastes by large corporations for commercial purposes.

28.383 Music of the Dance (3 q.h.)

The world of the dance, with strong emphasis on the creative art of ballet. This course probes deeply into the dynamic qualities of music for the dance and the talented people in the field who successfully brought about its present position as a fusion of all the arts.

28.390 Directed Study 1 (3 q.h.)

Independent work under the direction of the department upon a chosen topic. (*Limited to qualified students with approval of department chairman.*) Prereq. Dept. approval.

28.391 Directed Study 2 (3 q.h.)

Second opportunity to do independent work as described in 28.390.

28.398 American Musical Theatre (3 q.h.)

A historical survey and analytic study of musical shows. Students will attend performances and write critical reviews.

28.402 Music History to 1750* (formerly Music History I—Musical Literature to 1750) (3 q.h.)

A study of sacred and secular musical literature from the early Middle Ages through the Baroque. Listening to and discussing monophony, organum, music of the troubadours and trouveres; motets, masses, and secular music by Machaut, Dufay, Josquin, Palestrina, Byrd; Elizabethan music, both vocal and instrumental; early Italian opera; music of the German Protestants, culminating in the works of Bach and Handel, will give the student an evolutionary view of music history and style during this period.

28.403 Music History of the Classical Period* (formerly Music History 2—Music of the Classical Period) (3 q.h.)

A study of changing musical styles from Stamitz and the Mannheim School through the works of Haydn, Mozart, and early Beethoven.

28.404 Music History of the Romantic Era* (formerly Music History 3—Music of the Romantic Era) (3 q.h.)

Musical styles of the nineteenth century. The role of music and the musician in the changing social, economic, political, and cultural structure of Europe. Music by Beethoven, Schubert, Berlioz, Brahms, Verdi, and Wagner will be heard, discussed, and analyzed.

28.409 Form and Analysis (3 q.h.)

This course begins with a study of the principles of unity and variety in musical composition. Representative works from all periods of Western art music are used to analyze and study such single-member forms as theme and variation, rondo, minuet and trio, sonata-allegro, passacaglia, canon, and fugue. *Prereq.* 28.426 or equiv.

28.410 Music History of the Twentieth Century* (formerly Music History 4—Music of the Twentieth Century) (3 q.h.)

The diversity of styles from Debussy through Stravinsky, Schoenberg, Bartok, Hindemith, and more recent developments, including musique concrete, chance music, and electronic music.

B. Musical Performance and Theory**28.411 Musical Performance 1** (1 q.h.)

Participation in rehearsals and public performances and/or research, composition, arranging, conducting, solo and ensemble activity, etc., with the NU Symphony Orchestra, the Early Music Players, the NU Chorus, the NU Bands, or other ensembles under the supervision and coaching of a faculty member of the Department of Music. The student's progress will be evaluated at the end of the quarter by audition or otherwise. *Prereq.* Audition or permission of instructor.

28.412 Musical Performance 2 (1 q.h.)

Prereq. Audition or permission of instructor.

28.413 Musical Performance 3 (1 q.h.)

Prereq. Audition or permission of instructor.

28.414 Musical Performance 4 (1 q.h.)

Prereq. Audition or permission of instructor.

28.415* Conducting I (formerly 28.337) (3 q.h.)

The student is given the opportunity to learn how to develop a clear beat technique and how to prepare, teach, and polish a work in rehearsal; and is exposed to a basic repertoire and the basics of vocal/instrumental production. *Prereq.* A fundamental knowledge of music reading and concurrent membership in a performing ensemble.

28.418 Music Teaching in Studio and Classroom (3 q.h.)

This course will introduce the student to philosophy, principles, and procedures in the teaching of music in both studio and classroom settings.

28.419 Music Criticism—An Introduction (3 q.h.)

A practical approach to the methods of reviewing music as practiced in the press. Student reviews and discussions of area concerts will be augmented by a survey of historical criticism, public opinion, and performance practice. The course is designed to enrich a student's future as an informed music listener. Formal music background is not required.

28.424 Fundamentals of Music Theory (4 q.h.)

The basics of music theory are presented as a foundation for further musical study and activity. Work begins with aural and visual identification of pitches, intervals, major and minor scales, and triads in the G and F clefs. Activities include rhythmic and simple melodic dictation, sight reading, elementary melodic writing, and chord construction.

28.425 Music Theory 1 (4 q.h.)

Theory 1 includes visual identification of pitches in the soprano, alto, and tenor clefs, transposition, some elementary arranging, writing and aural identification of cadences, elementary musical analysis, melodic and rhythmic dictation, and sight reading. *Prereq.* 28.424 or equiv.

28.426 Music Theory 2 (4 q.h.)

Theory 2 is a continuation of Theory 1. This course includes elementary four-part writing, introduction to figured bass, score reading, and harmonic analysis. Activities include harmonic as well as melodic dictation and part singing by sight. *Prereq.* 28.425.

28.427* Music Theory 4 (formerly 28.405) (3 q.h.)

Intermediate four-part writing and analysis, including use of triad inversions, seventh chords, nonharmonic tones, and simple modulation. Keyboard harmony. *Prereq.* 28.401, 28.330, and 28.373 or consent of instructor.

28.428* Music Theory 5 (formerly 28.406) (3 q.h.)

Four-part writing, including secondary dominants, non-dominant seventh, ninth, eleventh, and thirteenth chords; linear embellishment of harmony, harmonization of melody, and musical analysis. Keyboard harmony.

Prereq. 28.427 or equiv. or consent of the instructor prior to registration.

28.429* Music Theory 6 (formerly 28.407) (3 q.h.)

Four-part writing, including chromatic and other nondiatonic harmony and advanced modulation; keyboard harmony; introduction to modern chord symbols and basics of serial writing; continuation of musical analysis.

Prereq. 28.428 or equiv. or consent of instructor prior to registration.

28.431* Piano Class 1 (formerly 28.371) (3 q.h.)

For beginning piano students. Each student progresses at his or her own pace, and grades are achieved by passing various step levels. Ownership of a piano is not a necessary requirement for taking this course.

28.432* Piano Class 2 (formerly 28.372) (3 q.h.)

Introduces scales, arpeggios, and triads to help students perform more advanced music. The repertoire consists of original compositions by the instructor and simple works by Bartok and Kabalevsky. *Prereq.* 28.431 or equiv. or consent of instructor.

28.433* Piano Class 3 (formerly 28.373) (3 q.h.)

Introduces two-octave scales, arpeggios, and triads in all keys. Repertoire consists of Bartok, Kabalevsky, original compositions by the instructor, and duets specifically arranged for this course. *Prereq.* 28.432 or equiv. or consent of instructor.

28.434 Recorder Class 1 (3 q.h.)

This course is for beginners. The rudiments of recorder technique and note reading are presented. Students must provide their own instruments.

28.435 Recorder Class 2 (3 q.h.)

A continuation of Recorder Class 1, for those who already have a basic knowledge of elementary recorder technique, including two octaves of fingering and note reading. Simple solo and small ensemble literature is studied. *Prereq.* 28.434 or permission.

28.436 Recorder Class 3 (3 q.h.)

Recorder Class 3 is for early intermediate students. Solo and ensemble literature is studied. Students are expected to work with both C and F instruments. *Prereq.* 28.435 or permission.

28.437 Guitar Class 1 (3 q.h.)

This course is for beginners. The student is introduced to basic finger technique, note reading, and simple chord position. Students must provide their own instruments.

28.438 Guitar Class 2 (3 q.h.)

A continuation of Guitar 1, or for those who already have a basic knowledge of finger techniques and note reading. Repertoire suitable to the advanced beginner is introduced, as well as elementary studies in improvisation. *Prereq.* 28.437 or permission.

28.439 Guitar Class 3 (3 q.h.)

Continuation of Guitar Class 2. Repertoire suitable for early intermediate students is presented. *Prereq.* 28.438 or permission.

28.441 Introduction to Orchestral Instrument Performance 1 (3 q.h.)

This course is designed for those who wish to learn to play an orchestral instrument and have had no previous experience. Beginning technique, note reading, practice methods, and repertoire suitable to the instrument and for the beginner are presented. Students must provide their own instruments.

28.442 Introduction to Orchestral Instrument Performance 2 (3 q.h.)

Continuation of 28.441.

28.443 Introduction to Orchestral Instrument Performance 3 (3 q.h.)

Continuation of 28.442.

Instrumental Workshops (3 q.h. each)

Instrumental workshops are designed for students who have at least a rudimentary ability to play an instrument. Class sessions include instruction in technique, practice methods, sight reading, and standard repertoire appropriate to the level of each student. Assignments in solo and small ensemble repertoire are given with the expectation that students will practice daily and be prepared for weekly performance and critique in class. Students (other than those in a Piano Workshop) must provide their own instruments.

28.451 28.452 28.453 Piano Workshop 1, 2, 3
28.454 28.455 28.456 Woodwind Workshop 1, 2, 3
28.457 28.458 28.459 String Workshop 1, 2, 3
28.461 28.462 28.463 Brass Workshop 1, 2, 3
28.464 28.465 28.466 Percussion Workshop 1, 2, 3

28.467 Chamber Music 1 (3 q.h.)

Students will rehearse, study, and perform music for from two to six players under the guidance of a faculty coach. Players, matched according to level, will meet weekly for one-hour sessions. Repertoire, to be selected from the full range of European concert music, will be chosen by the instructor in consultation with the students. For details, contact U.C. Music Coordinator, Edgar Weiss, in 307 Ell Building; telephone 437-2440.

28.468 Chamber Music 2 (3 q.h.)

Continuation of Chamber Music 1. *Prereq.* 28.467 or permission.

28.469 Chamber Music 3 (3 q.h.)

Continuation of Chamber Music 2. *Prereq.* 28.468 or permission.

28.471 Instrument Tutorial 1 (3 q.h.)

The Instrument Tutorial gives the student an opportunity to have individual instruction on a musical instrument or in voice. Students at any level from beginner to advanced have weekly forty-five-minute lessons. Instrumental technique and repertoire suitable to the

student's level are presented. Those desiring credit are required to play an audition examination at the end of the quarter. Tutorial carries a special lesson fee for individualized instruction. For details, contact U.C. Music Coordinator, Edgar Weiss, in 307 Ell Building; telephone 437-2440.

28.472 Instrument Tutorial 2 (3 q.h.)

Continuation of 28.471.

28.473 Instrument Tutorial 3 (3 q.h.)

Continuation of 28.472.

28.481 Master Class 1 (3 q.h.)

The Master Class for intermediate and advanced instrumental and vocal students includes student performance of standard repertoire appropriate to the instrument and individual student with critique by the master teacher. The main emphasis is on musical interpretation. Students are expected to prepare for weekly performance in class. Students must provide their own instruments.

28.482 Master Class 2 (3 q.h.)

Continuation of 28.481.

28.483 Master Class 3 (3 q.h.)

Continuation of 28.482.

28.495 Honors Program 1 (4 q.h.)

Independent work in a selected musical area under the direction of members of the department. Limited to qualified students with the approval of the department chairman and only by special arrangements with the supervising faculty member. *Prereq.* *Permission of the Dean.*

28.496 Honors Program 2 (4 q.h.)

Prereq. 28.495.

28.497 Honors Program 3 (4 q.h.)

Prereq. 28.496.

29: Theatre Arts

Consultant: Prof. E. J. Blackman, Chairman, Drama Dept. (College of Arts and Sciences)

29.310 Theatre Management (3 q.h.)

Surveys business problems of financing, promoting, programming for educational, community, and professional theatre. Visits by practicing professionals; practical application through class projects, working on actual productions. (A good course for those interested in business careers/arts management.)

29.311 Theatre Appreciation* (formerly Introduction to Theatre Arts) (3 q.h.)

Aimed at developing in theatregoers an appreciation of the total theatre experience, by studying the roles that the playwright uses to bring a script to life. Through the reading of selected plays, the student begins to understand the role of the director, the actors, and the designers. The plays are analyzed from the viewpoint of both the artist and the audience.

29.312 Theatre Experience (3 q.h.)

Through creative analysis of model plays and perhaps attendance at one or two live performances, the theatre as a collaborative art form comes into focus. The link between practice and theory is shown by giving the student an understanding of the dynamics of acting, directing, designing, lighting, and the mandates of theatre economics. Cost of theatre tickets is not included in tuition. *Prereq.* 29.311 or permission of instructor.

29.320 Prizewinning Plays (3 q.h.)

What makes a play win the Pulitzer Prize, a Tony Award, the Nobel Prize? An examination of selected plays and their productions that have been the recipients of one or more of these prizes provides some answers.

29.338 Introduction Mime Workshop (3 q.h.)

In-depth introduction to mime: illusionary technique, silent acting, and creating material for mime-theatre.

29.339 Advanced Mime Workshop (3 q.h.)

A production workshop. Focuses on creating solo and ensemble materials and refining illusionary techniques. Class culminates in a public performance of material created by the students. Previous training with *The Pocket Mime Theatre* or permission of the instructor. Taught by principal mime with the company. *Prereq.* 29.338 or permission of instructor.

29.341 Workshop for the Actor 1 (3 q.h.)

Physical preparation; basic stage movement and deportment; the control of the stage voice; the analysis and establishment of characterization through observation and awareness of the body; improvisations and short scenes.

29.342 Workshop for the Actor 2 (3 q.h.)

Psychological preparation. The analysis and establishment of characterization through memory, emotion, imagination, and recall. Analysis of specific roles, the creation of a character analysis book, improvisations, and short scenes. *Prereq.* 29.341 or permission of instructor.

29.343 Workshop for the Actor 3 (3 q.h.)

Preparing and performing the role. The physical and psychological preparation of specific roles. Short classroom scenes; the presentation of a one-act play. *Prereq.* 29.342 or permission of instructor.

29.344 Drama Movement and Therapy (3 q.h.)

An exploration of teaching and rehabilitative methods, using the techniques of creative dramatics and dance/movement therapy. An emphasis will be placed on the exceptional child and on the physically and emotionally handicapped.

29.345 Creative Dramatics for Teachers (3 q.h.)

Introduction to the methods and creative techniques of using dramatics for programs in schools, churches, and recreational facilities. Teachers can learn how to use improvisation for self-improvement for a variety of students; for example, children and older adults.

29.350 The Comic Theatre (3 q.h.)

An examination of the writing and the staging of works by Aristophanes, Molière, Shaw, Neil Simon. The nature, the functions, the techniques of comic writing and comic performance.

29.380 The Creative Cinema (3 q.h.)

A seminar designed to give the student an opportunity to view and critique films and the work of their directors, performers, and other creative personnel. Cost of cinema tickets not included in tuition.

29.394 The Shakespeare Experience (3 q.h.)

A seminar designed to give the student the opportunity to view and critique live productions and/or motion picture and television versions of plays by William Shakespeare.

29.395 The Boston Theatre Scene (3 q.h.)

This is a learning experience that stays current with what's on stage in Boston during the period that the course is scheduled. Students have the opportunity to view and critique live performances presented in the area's major and "Off-Broadway" theatres. Cost of theatre tickets is not included in tuition.

30: English

English Consultant: Prof. M. X. Lesser, English Dept. (College of Arts and Sciences)

Technical Communications Consultant: Neil F. Duane (Hewlett Packard Corp.)

Some students may be requested to register for Elements of Writing (30.304) or English for International Students (30.301 and/or 30.302) for additional help in writing. For details see "Placement Tests" on page 26.

A. Writing and Language**30.301 English for International Students 1** (noncredit)

An introduction to the grammar and rhetoric of English as a second language. Practice in listening, speaking, and writing, with selected readings and exercises for vocabulary and pronunciation.

30.302 English for International Students 2 (noncredit)

An intermediate course in English as a second language. Practice in preparing written and oral reports, including business and social letters. *Prereq.* 30.301 or *equiv.*

30.304 Elements of Writing (3 q.h.)

An intensive review of grammatical forms and structural patterns of current English. Practice in writing sentences, paragraphs, and short papers. Enrollment by referral only.

30.305 English 1 (3 q.h.)

A detailed examination of the principles and methods of rhetoric, especially narration, description, and ex-

position, and frequent practice in writing paragraphs and themes in those modes.

30.306 English 2 (3 q.h.)

Continued examination of the principles and methods of rhetoric, especially persuasion and argument; the study of short fiction; and the development of research skills. Practice in writing persuasive and critical themes and in preparing a research paper. *Prereq.* 30.305 or *equiv.*

30.307 English 3 (3 q.h.)

A further refinement of writing and analytical skills through the study of drama and poetry. Practice in writing longer critical papers. *Prereq.* 30.306 or *equiv.*

30.308 Expository and Persuasive Writing 1* (formerly Expository Writing 1) (3 q.h.)

Designed to help students develop confidence and proficiency in writing. Through first drafts to revisions, weekly writing assignments concentrate on mastering the skills of subject focus, clarity of expression, controlled development, and organization. Attention is paid to improving grammatical accuracy and sentence structure within the revision process. The concluding focus is on understanding expository writing as a reflection of logical thinking. *Prereq.* 30.305 or *equiv.*

30.309 Expository and Persuasive Writing 2* (formerly Expository Writing 2) (3 q.h.)

Focus is on developing precise and persuasive writing patterns through experimentation with various rhetorical strategies. Using topics that are currently significant, students write extensively to gain fluency in adapting to different audiences. Students learn to write for persuasive effect and to use different writing models to gain practical control of material. *Prereq.* 30.308 or *equiv.*

30.310 Expository Communications* (formerly Expository Writing 3) (3 q.h.)

A workshop in expository prose, emphasizing the practical problems of the writer on the job in advertising, public relations, or publishing. Practice in designing and writing special projects. *Prereq.* 30.309.

30.311 Business Writing and Reports 1 (3 q.h.)

An introduction to the vocabulary and philosophy of business communications. Practice in the planning, writing, and analyzing of effective business letters and memoranda.

30.312 Business Writing and Reports 2 (3 q.h.)

Methods and principles of research and documentation of semi-technical analyses and business reports. Practice in organizing and writing complex forms of business communications. *Prereq.* 30.311 or *equiv.*

30.313 Business Writing and Reports (Intensive) (6 q.h.)

A combination of 30.311 and 30.312.

30.317 Creative Writing: Fiction (3 q.h.)

A course for beginning writers of short fiction. Practice in writing short stories in various forms, discussion and criticism of student work and selected texts.

30.318 Creative Writing: Poetry (3 q.h.)

A course for beginning writers of poetry. Practice in writing poems in various forms and modes, discussion and criticism of student work and selected texts.

30.319 Creative Writing Workshop (3 q.h.)

A course for practicing writers. Discussion and criticism of student manuscripts.

30.320 The English Language (3 q.h.)

Development of modern English from pre-Anglo-Saxon beginnings; effects of Roman, Scandinavian, and Norman invasions; dialect geography; evolutionary change, word formation, and borrowing.

30.321 Linguistics (3 q.h.)

Theories of the nature and origin of language; review of historical and comparative linguistics; prescriptive and descriptive grammars; structural and generative-transformational phonology, morphology, and syntax.

30.322 Semantics (3 q.h.)

The relation between language and behavior, levels of abstraction in communication, habits of evaluation of linguistic phenomena, and the modification of such habits for human understanding and survival.

30.325 Advanced English for International Students (3 q.h.)

An advanced course in English as a second language. Practice in special forms of writing to broaden diction, syntax, and organizational techniques. *Prereq.* 30.302 or permission of instructor.

30.326 Book Publishing (3 q.h.)

Helps provide students with a working knowledge of the book publishing industry and its editorial functions. Assists the aspiring writer's efforts to win acceptance by a publisher.

B. Technical Writing**30.410 Technical Writing 1 (3 q.h.)**

Introduces the history and principles of technical writing. Improves basic technical writing skills by providing practice in basic descriptive writing, writing definitions, and preparing outlines and abstracts. The course provides practice in improving research skills with a guided library research project in the field of technical writing. Considerable writing practice is provided.

30.411 Technical Writing 2 (3 q.h.)

Provides exposure and practice in various types of technical writing, including descriptions of objects, mechanisms, and processes. Develops a student's capability in preparing various types of reports, including progress reports, recommendations, and oral reports. Introduces the preparation of proposals and use of

graphic aids in supporting the writing process. Considerable writing is provided. *Prereq.* 30.410.

30.412 Technical Writing (Intensive) (6 q.h.)

Equivalent to 30.410 and 30.411.

30.413 Editing for Science and Technology (3 q.h.)

This course teaches the fundamentals of editing as they apply to science, technical, and engineering writing. It covers the role of the editor in business, industry, and the sciences; basic editorial services—proofreading, copy and content editing, production editing, project editing; analyzing and critiquing manuscripts; working with authors; the editor as writer and interviewer; science interpretation and technical translation. Learning is enhanced for students already skilled in spelling and grammar.

30.415 Proposal Writing (3 q.h.)

Provides a background in the preparation of proposals, including ability to analyze a request for proposal (or bid set). Introduces the various types of proposals generated by industry and provides an opportunity to prepare a proposal in a simulated situation, through role playing and participation on a proposal preparation team. Considerable analysis and writing practice is provided. *Prereq.* 30.411 or permission of instructor.

30.420 Hardware Technical Manual Writing 1 (3 q.h.)

Introduces individuals who are competent in appropriate technical fields to the theory and practice of documenting the installation, operation, theory, and maintenance of electronic instruments and systems for industrial, aerospace, military, and medical applications. *Prereq.* 30.411 or permission of instructor.

30.421 Hardware Technical Manual Writing 2 (3 q.h.)

A continuation of 30.420, with special attention to developing the skills appropriate to writing each of the sections normally comprising an electronic instrument operating manual. Includes problems in organizing a typical manual, presentation of technical theory, maintenance procedures, test and adjustment procedures, and procedures for updating manuals as well as cataloging replaceable parts. *Prereq.* 30.420.

30.425 Computer Software Technical Writing 1 (3 q.h.)

A two-quarter course designed to introduce the tasks and problems unique to software technical writing. Major topics include review of fundamental software concepts, role and importance of software documentation, component parts of software technical manual and their purposes, tutorial and reference functions of manuals, research tools for manual writing, and the writing process itself. *Prereq.* 30.410 and 49.311 or permission of instructor.

30.426 Computer Software Technical Writing 2 (3 q.h.)

A continuation of 30.425. *Prereq.* 30.425.

30.430 The Business and Technical Presentation* (formerly 93.650) (3 q.h.)

The application of the principles of technical communication to audiovisual presentations. Includes audience analysis, techniques of organization, script preparation, media selection, the design and production of visuals, the influence of physical factors on communication, and the elements of effective video playback and peer critiques.

C. Literature

30.324 Gothic Fiction (3 q.h.)

A study of horror literature and its concerns with the supernatural, the irrational, the nature of evil, and the landscape of dreams, including such novels as *Dracula*, *Dr. Jekyll and Mr. Hyde*, and *The Turn of the Screw*.

30.327 Fiction in Motion: Film and the Novel (3 q.h.)

An introduction to the exciting relation between verbal literature and contemporary cinema. The successes (and some failures) in adapting famous novels and stories into worthy movies will be surveyed by comparing the original book to an analysis of the film inspired by it. Elementary film theory and criticism will be taught and applied to book-movies such as *Tom Jones*, *The Europeans*, *Sister Carrie*, *The Great Gatsby*, *Women in Love*, *The Big Sleep*, *The Treasure of Sierra Madre*, *The Night of the Hunter*, *Lolita*, *The Last Picture Show*, *Shane*, *One Flew Over the Cuckoo's Nest*, *East of Eden*, and *Looking for Mr. Goodbar*. (The number and choice of book-films may vary each quarter, depending upon instructor and rental availability.) (Lab. fee)

30.328 The Psychological Novel (3 q.h.)

A study of the mental and emotional processes affecting the form and style of such novels as *Crime and Punishment*, *The Metamorphosis*, and *The Stranger*.

30.329 Children's Literature (3 q.h.)

A study of the psychology of creation, the ways of the imagination, and the role of fantasy and play in such children's books as *Alice in Wonderland*, *The Wizard of Oz*, and *Charlotte's Web*.

30.330 Fantasy Literature (3 q.h.)

This course will investigate the development of fantasy literature in the nineteenth and twentieth centuries, focusing on the works of authors such as Lewis Carroll, Lord Dunsany, Kenneth Grahame, J. R. R. Tolkien, and Richard Adams.

30.338 Modern Irish Literature (3 q.h.)

Irish literature in English from 1885 to the present, including such writers as Yeats, Joyce, O'Casey, and Behan.

30.339 Irish Writers in America (3 q.h.)

A study of Irish themes and attitudes in the fiction and drama of twentieth-century America, including such writers as O'Neill, Donleavy, Alfred, and McHale.

30.340 European and English Short Story (3 q.h.)

The development of the short story in both Europe and England in the nineteenth and twentieth centuries. Such writers as Chekhov, Tolstoy, de Maupassant, Balzac, Mann, Camus, Kipling, Lawrence, Greene, and Böll will be examined in terms of their themes, forms, and techniques.

30.341 English Literature: To 1700* (formerly English Literature I) (3 q.h.)

A survey of English literature from its beginnings to 1700, including works by Chaucer, Spenser, Shakespeare, Donne, and Milton.

30.342 English Literature: Reason and Romanticism* (formerly English Literature to 1832) (3 q.h.)

A survey of English literature from the neoclassical to the romantic age, including works by Pope, Swift, Johnson, Blake, Wordsworth, and Keats.

30.343 English Literature: Victorians and Moderns* (formerly English Literature 3) (3 q.h.)

A survey of English literature from the Victorian Age to the present, including works by Browning, Arnold, Hardy, Yeats, and Eliot.

30.344 Early American Literature: Faith, Reason, and Nature* (formerly American Literature I) (3 q.h.)

A survey of American literature from the beginnings to the transcendentalists in the nineteenth century, including works by Bradstreet and Taylor, Edwards and Franklin, Emerson and Thoreau.

30.345 American Romanticism and American Realists* (formerly American Romanticism: Poe to Whitman) (3 q.h.)

A survey of the fiction and poetry of nineteenth-century America, including the works of Hawthorne and Melville, Whitman and Dickinson, Twain and James, Crane and Dreiser.

30.346 American Literature: The Modern Temper* (formerly American Literature III) (3 q.h.)

A survey of the prose and poetry of twentieth-century America, including the works of Eliot and Stevens, Fitzgerald and Hemingway, Wright and Plath.

30.347 Science Fiction (3 q.h.)

The myths and rhetorical strategies of science fiction, including such novels as *Frankenstein*, *Childhood's End*, and *Stranger in a Strange Land*.

30.348 Images of Women in Literature (3 q.h.)

A descriptive and analytic study of the images of women and the archetypes underlying them in imaginative literature, including such writers as Homer, Austen, Ibsen, and Lawrence.

30.349 American Women Writers (formerly Images of Women in Literature II) (3 q.h.)

A study of representative women writers in America in the nineteenth and twentieth centuries, including such poets as Dickinson and Plath and such novelists as Chopin and Cather.

30.350 British Women Writers (3 q.h.)

Examines important historical and thematic connections in the work of British women writers of the last 200 years, including the novels of Jane Austen, George Eliot, Virginia Woolf, and Doris Lessing.

30.357 Faith and Science: The Seventeenth Century (formerly The Seventeenth Century) (3 q.h.)

Examines in depth the prose and poetry of the writers of seventeenth-century England, including such writers as Bacon and Locke, Donne and Marvell, Bunyan and Milton.

30.366 Detective Fiction (3 q.h.)

Elements of intrigue, logic, and thought converge in this study of the who-done-it. Students sample a wide range of detective fiction to explore the questions of innocence and guilt, action and responsibility, power and authority, victim and victimizer, and to see connections between this popular form of literature and its classical antecedents.

30.373 The Twentieth Century (3 q.h.)

Examines in depth the prose and poetry of the major writers of twentieth-century England, including such writers as Yeats, Eliot, Joyce, Lawrence, Auden, and Thomas.

30.380 Ethnic Literature in America (3 q.h.)

Explores the range, variety, and themes of ethnic literature in America in the work of such writers as Nelson Algren, James I. Farrell, Philip Roth, and William S. Royan.

30.381 The American Short Story (3 q.h.)

The development of the American short story from its nineteenth-century origins to its present experiments, including such writers as Poe, Hawthorne, James, Hemingway, Roth, and Updike.

30.384 Contemporary American Poetry (3 q.h.)

A study of the structure and themes of poetry in post-1945 America, including such writers as Ginsberg, Plath, Snodgrass, and Wilbur.

30.385 The Contemporary Novel (formerly The Modern European Novel) (3 q.h.)

A study of the structure and themes of post-1945 American, British, and European novels by such writers as Barth, Hawkes, Lessing, Powell, Grass, and Solzhenitsyn.

30.387 Contemporary English Poetry (3 q.h.)

A study of the structure and themes of poetry in post-1945 England, including the work of Gunn, Hughes, Larkin, and Levertov.

30.388 Outside the Mainstream: The Literature of America's Subcultures (3 q.h.)

A study of literature that reflects the specific interests, values, and concerns of America's diverse subcultural populations, including such works as *Black Elk Speaks*, *City of Night*, *Woman Warrior*, and the stories of Isaac Bashevis Singer.

30.389 Modern American Voices: The New Essayists (3 q.h.)

Examines selected major nonfiction of the 1960s and 1970s, stressing the fresh styles and often disturbing cultural perspectives of such works as Norman Mailer's *The Armies of the Night*, Robert Persig's *Zen and the Art of Motorcycle Maintenance*, Annie Dillard's *Pilgrim at Tinker Creek*, and Brautigan's *Trout Fishing in America*, as well as shorter works in the "new journalism" and personal essays by writers like Joan Didion, Tom Wolfe, Susan Sontag, and Woody Allen.

30.390 The American Novel (3 q.h.)

Traces the development of the novel in America and the characteristic qualities that inform it. May include such writers as Cooper and Melville, James and Wharton, Faulkner and Ellison.

30.391 Honors Program 1 (4 q.h.) See p. 68.**30.392 Honors Program 2 (4 q.h.)**

Prereq. 30.391.

30.393 Honors Program 3 (4 q.h.)

Prereq. 30.392.

30.395 Directed Study 1 (3 q.h.)

An opportunity for qualified students to take an upper-level required course when the needed course is not available at the time recommended for a specific degree. Petitions and procedural instructions are available in 204 Churchill Hall. *Allow at least six weeks to complete petition process.* *Prereq.* 87 q.h.

30.396 Directed Study 2 (3 q.h.)

An opportunity to initiate a second individual study as described above. *Prereq.* 30.395.

30.450 Shakespeare the Dramatist (3 q.h.)

Examines in detail and at length the dramatic work of Shakespeare in an attempt to define and illustrate the formal strategies and important themes of such representative plays as *Merchant of Venice*, *I Henry IV*, *As You Like it*, and *Hamlet*.

30.451 Major Figures in Poetry (3 q.h.)

Examines closely the work of one poet from apprenticeship to maturity, in both form and theme, chosen from among the major figures in England and America from Chaucer and Milton to Dickinson and Frost.

30.452 Major Figures in Fiction (3 q.h.)

Examines closely the work of one writer of fiction from apprenticeship to maturity, in both form and theme, chosen from among the major figures in England and America from Austen and Cooper to Joyce and Bellow.

30.453 The Ancient and Medieval Worlds (3 q.h.)

Focuses upon the literature of the Bible and the principal writers of ancient Greece and Rome and medieval Europe, for example, Homer and Sophocles, Ovid and Virgil, Dante and Boccaccio.

30.454 From The Renaissance to Romanticism (3 q.h.)

Traces the literary achievement of the Renaissance, the Enlightenment, and the Romantic Age through a study of such writers as Rabelais and Cervantes, Racine and Voltaire, and Goethe and Wordsworth.

30.455 From Realism to Modernism (3 q.h.)

Examines the fiction and drama of the nineteenth century and the chief literary influences of the twentieth century, including such writers as Flaubert, Dostoyevsky, Ibsen, Chekhov, Baudelaire, Eliot, Woolf, Joyce, and Kafka.

30.456 Shakespeare: The Major Tragedies and Comedies (3 q.h.)

Focuses upon the productions of Shakespeare's mature dramatic art, for example, *King Lear*, *Twelfth Night*, *Antony and Cleopatra*, and *The Tempest*.

30.461 Order and Disorder: The Eighteenth Century (3 q.h.)

Examines in depth the prose and poetry of the major writers of eighteenth-century England, such as Pope and Swift, and Johnson and Boswell, and documents the rise of sentimentality and sensibility.

30.462 Romantics and Victorians: The Nineteenth Century (3 q.h.)

Examines in depth the prose and poetry of the major writers of nineteenth-century England, including such writers as Wordsworth and Keats, Carlyle and Ruskin, Tennyson and Browning.

30.463 The English Novel (3 q.h.)

Traces the development of the English novel from its robust beginnings in the eighteenth century through its concern with manners and morals in the nineteenth century and the experiments of the twentieth century, and may include such writers as Defoe and Fielding, Dickens and Eliot, Joyce and Lawrence.

30.464 The Continental Novel (3 q.h.)

Traces the development of the European novel through its various forms and themes from the early masters to the later ones, from Balzac and Tolstoy to Proust and Mann.

30.470 The Biography and Non-Fiction (3 q.h.)

Studies biography in an attempt to understand the nature of individual behavior and achievement, as they relate to social, cultural, political, and artistic values.

31–36: Modern Languages and American Sign Language

Modern Language Consultant: Prof. Holbrook Robinson, Chairman, Modern Language Dept. (College of Arts and Sciences)
ASL Coordinator: Cathy Cogen

Directed Study Option: When a language course is needed for a degree but is not available on the regular schedule at appropriate intervals, arrangements can be

made to take 3 directed studies for a total of 12 q.h. Course numbers for **French Directed Study 1, 2, 3** are **31.495, 31.496, 31.497**; for **Spanish, 32.495, 32.496, 32.497**, and so forth. Petitions and procedural instructions are available in 204 Churchill Hall. *Allow at least 6 weeks to complete petition process. Prereq. 87 q.h.*

31: French**31.401 Elementary French 1** (4 q.h.)

Essentials of grammar, practice in pronunciation, and progressive acquisition of a basic vocabulary and idiomatic expressions.

31.402 Elementary French 2 (4 q.h.)

Continuation of grammar study. Oral and written exercises. *Prereq. 31.401 or equiv.*

31.403 Elementary French 3 (4 q.h.)

Reading of French prose of increasing difficulty, with written and oral exercises based on the materials read; practice in conversation. *Prereq. 31.402 or equiv.*

31.404 Intermediate French 1 (4 q.h.)

A review of grammar, with practice in composition and conversation. *Prereq. 31.403 or equiv.*

31.405 Intermediate French 2 (4 q.h.)

History of French civilization, with discussions and conversation. *Prereq. 31.404 or equiv.*

31.406 Intermediate French 3 (4 q.h.)

Intensive reading of modern French prose, with conversational practice. *Prereq. 31.405 or equiv.*

31.421 French Literature 1 (3 q.h.)

Origins of French literature, with readings from major works of the Middle Ages. *Prereq. 31.406 or equiv.*

31.422 French Literature 2 (3 q.h.)

Selections from the Classical period in the seventeenth and eighteenth centuries. *Prereq. 31.421 or equiv.*

31.423 French Literature 3 (3 q.h.)

Readings from major works of the nineteenth and twentieth centuries. *Prereq. 31.422 or equiv.*

32: Spanish**32.401 Beginning Conversational Spanish 1*** (formerly Elementary Spanish I) (4 q.h.)

Stresses the acquisition of basic oral skills by introducing the essentials of Spanish grammar with extensive practice in pronunciation and acquisition of an idiomatic core vocabulary.

32.402 Beginning Conversational Spanish 2* (formerly Elementary Spanish II) (4 q.h.)

Continuation of 32.401, with introduction of Spanish prose of moderate difficulty. *Prereq. 32.401 or equiv.*

32.403 Beginning Conversational Spanish 3* (formerly Elementary Spanish III) (4 q.h.)

Continuation of 32.401 and 32.402. Continued stress on conversation, while building a solid core of basic Spanish. *Prereq. 32.402 or equiv.*

32.404 Intermediate Spanish 1 (4 q.h.)

Review of grammar, with practice in composition and conversation. *Prereq.* 32.403 or *equiv.*

32.405 Intermediate Spanish 2 (4 q.h.)

Spanish civilization through texts of average difficulty. Intensive reading of modern prose, with occasional oral or written translation, conversation practice based on assigned readings. *Prereq.* 32.404 or *equiv.*

32.406 Intermediate Spanish 3 (4 q.h.)

Spanish-American civilization through texts of average difficulty. Intensive reading of modern prose, with occasional oral or written translation, conversation practice based on assigned readings. *Prereq.* 32.405 or *equiv.*

32.420 Conversational Spanish for the Law Enforcement Professional (4 q.h.)

Intended for the law enforcement officer who is now, or will soon be, working in the Hispanic community. The course will cover basic Spanish needed for interviewing a suspect, obtaining personal descriptions, reporting a traffic accident, giving directions, receiving communications about robbery, fire, missing persons, and other situations common to police work. Elementary points of Spanish grammar will be presented.

32.425 Spanish: The Generation of '98. The Great Flowering of Modern Spanish Letters (4 q.h.)

At the turn of the century, Spain passed through a crisis of national conscience. As the stature of Spain diminished, great writers of the day began to question their country's values. The result was a new literary flowering, a second Golden Age of Spanish literature. The course will examine this literary renaissance by presenting the works of Unamuno, Machado, Valle Inclán, Baroja, Azorín, Ortega y Gasset, Pérez de Ayala. *Prereq.* 4 years of Spanish or *equiv.*

33: German**33.401 Elementary German 1** (4 q.h.)

Essentials of grammar, practice in pronunciation, progressive acquisition of a basic vocabulary and idiomatic expressions.

33.402 Elementary German 2 (4 q.h.)

More difficult points of grammar, particularly uses of subjunctive mood. *Prereq.* 33.401 or *equiv.*

33.403 Elementary German 3 (4 q.h.)

Reading of simple German prose, with oral and written exercises based on material read; German conversation encouraged. *Prereq.* 33.402 or *equiv.*

33.404 Intermediate German 1 (4 q.h.)

A review of grammar, with practice in composition and conversation. *Prereq.* 33.403 or *equiv.*

33.405 Intermediate German 2 (4 q.h.)

History of German civilization, with discussions and conversation. *Prereq.* 33.404 or *equiv.*

33.406 Intermediate German 3 (4 q.h.)

Intensive reading of modern German prose, with conversational practice. *Prereq.* 33.405 or *equiv.*

34: Arabic, Japanese, and Swedish**34.410* Elementary Arabic 1** (formerly 36.301) (4 q.h.)

An introduction to Arabic and related aspects of Arabic culture through oral comprehension, speaking, reading, and some writing of the language.

34.411* Elementary Arabic 2 (formerly 36.302) (4 q.h.)

Continuation of 34.410 with practice in elementary conversation, reading, and writing. *Prereq.* 34.410 or *equiv.*

34.412* Elementary Arabic 3 (formerly 36.303) (4 q.h.)

Continuation of 34.411, building the basic skills necessary to perform in the language at an elementary level. *Prereq.* 36.411 or *equiv.*

34.421 Elementary Japanese (4 q.h.)

Designed specifically as an introduction to basic, practical Japanese, the course stresses the essentials of grammar, pronunciation, progressive acquisition of a core vocabulary and idiomatic, current expressions.

34.422 Elementary Japanese 2 (4 q.h.)

Continuation of 34.421. Progressive acquisition of practical skills. *Prereq.* 34.421 or *equiv.*

34.423 Elementary Japanese 3 (4 q.h.)

Continuation of 34.422. *Prereq.* 34.422 or *equiv.*

34.424 Intermediate Japanese 1 (4 q.h.)

Review of grammar, with practice in composition and conversation. *Prereq.* 34.423 or *equiv.*

34.425 Intermediate Japanese 2 (4 q.h.)

Japanese history and civilization through texts of average difficulty, oral practice and composition based on covered materials. *Prereq.* 34.424 or *equiv.*

34.426 Intermediate Japanese 3 (4 q.h.)

Continuation of 34.425. *Prereq.* 34.425 or *equiv.*

34.460 Beginning Conversational Swedish 1 (4 q.h.)

Stresses the acquisition of basic oral skills by introducing the essentials of Swedish grammar, with extensive practice in pronunciation and acquisition of an idiomatic core vocabulary.

34.461 Beginning Conversational Swedish 2 (4 q.h.)

Continuation of 34.460, with introduction of Swedish prose of moderate difficulty. *Prereq.* 34.460 or *equiv.*

34.462 Beginning Conversational Swedish 3 (4 q.h.)

Continuation of 34.461. *Prereq.* 34.461 or *equiv.*

35: Italian**35.431 Elementary Italian 1** (4 q.h.)

Essentials of grammar, practice in pronunciation, and progressive acquisition of a basic vocabulary and idiomatic expressions.

35.432 Elementary Italian 2 (4 q.h.)

Continuation of grammar study. Oral and written exercises. *Prereq.* 35.431 or *equiv.*

35.433 Elementary Italian 3 (4 q.h.)

Reading of Italian prose of increasing difficulty, with written and oral exercises based on the material read, practice in conversation. *Prereq.* 35.432 or *equiv.*

35.434 Intermediate Italian I (4 q.h.)

A review of grammar, with practice in composition and conversation. *Prereq.* 35.433 or *equiv.*

35.435 Intermediate Italian 2 (4 q.h.)

History of Italian civilization, with discussions and conversation. *Prereq.* 35.434 or *equiv.*

35.436 Intermediate Italian 3 (4 q.h.)

Intensive reading of modern Italian prose, with conversational practice. *Prereq.* 35.435 or *equiv.*

36: American Sign Language

Please note that all course numbers have been changed to suggest the logical order in which ASL courses should be taken.

36.401* American Sign Language 1 (formerly 36.372) (4 q.h.)

An introduction to American Sign Language, the language used by members of the Deaf community in the United States and parts of Canada. Focuses on conversation in signs, basic rules of grammar, and aspects of the culture of the Deaf community.

36.402* American Sign Language 2 (formerly 36.373) (4 q.h.)

Continuation of basic language and culture study, with opportunities to build receptive and expressive sign vocabulary; use of the signing space, further use of nonmanual components, including facial expressions and body postures; introduction to finger spelling. *Prereq.* 36.401 or *consent of instructor.*

36.403* Intermediate American Sign Language 1 (formerly 36.377) (4 q.h.)

Emphasizes further development of receptive and expressive skills, finger spelling, vocabulary building, grammatical structures. Encourages more creative use of expression, classifiers, body postures, and the signing space. Introduces sign variations (regional and ethnic), and political and educational institutions of the Deaf community. *Prereq.* 36.402 or *consent of instructor.*

36.404* Intermediate American Sign Language 2 (formerly 36.378) (4 q.h.)

Intensive practice involving expressive and receptive skills in story telling and dialogue. Introduction to language forms found in ASL poetry and features of culture as they are displayed in art and theatre. *Prereq.* 36.403 or *consent of instructor.*

36.405* Linguistics of American Sign Language (formerly 36.370) (4 q.h.)

Designed for skilled signers of ASL with no previous training in linguistics. Conducted in ASL, the course is descriptive and date-oriented rather than theoretical. Topics to be covered include the parts of a sign, how to build words in ASL, sentence structure (questions, statements, relative clauses, etc.), meaning and the issue of iconicity, how ASL organizes sentences according to old and new information, and the structure of stories in ASL. Grammatical features of ASL, such as classifiers, specifiers, verb modulations, and aspect, and the role of facial expression are also discussed.

36.406* American Deaf Culture (formerly 36.385) (4 q.h.)

Focuses on the status of Deaf people as both a linguistic and cultural minority group. Designed for individuals who may or may not have had prior experience with Deaf people, the course raises questions concerning the nature of sign language and its varieties, educational and historical treatment of deafness, the sociological and cultural makeup of Deaf individuals, and the nature of ASL literature and poetry.

36.407* Sign Language Interpreting 1 (formerly 36.374) (4 q.h.)

First of a three-course sequence involving the theoretical and practical aspects of simultaneous interpretation of English into sign language and vice versa. Through lectures, discussions, and role playing, students are introduced to ethics, definitions, client-interpreter relationships, linguistic considerations, mechanics, and special considerations for various interpreting situations. Each student must have access to a cassette recorder and one cassette. *Prereq.* 36.404 or *consent of instructor.*

36.408* Sign Language Interpreting 2 (formerly 36.375) (4 q.h.)

For students who have completed a basic course or who are currently working as interpreters. Lectures, discussions, and role playing cover topics that include ethics, role, fees, professional and legal issues, and the certification process. Laboratory work focuses on increasing skills in simultaneously interpreting English into sign language and vice versa. Each student must have access to a cassette recorder and one cassette. *Prereq.* 36.407 or *consent of instructor.*

36.409* Sign Language Interpreting 3 (formerly 36.376) (4 q.h.)

For students who have completed the equivalent of Sign Language Interpreting 1 and 2 and who wish to upgrade their skills. Laboratory work focuses on interpreting ASL into English and vice versa, and transliterating spoken English into manual English. Each student must have access to a cassette recorder and one cassette. *Prereq.* 36.408 or *consent of instructor.*

36.410* Practicum in Sign Language Interpreting 1 (formerly 36.382) (4 q.h.)

Sixty hours of sign language observation and interpreting under supervision of interpreters or staff in various settings arranged with the instructor. Twenty-four hours of seminar will be held to discuss ethics, professional conduct, and other problems that arise in student assignments. This sequence is designed to assist the student in preparing for the National Registry of Interpreters for the Deaf Certification Evaluation. *Prereq.* 36.409 or *equiv.*

36.411* Practicum in Sign Language Interpreting 2 (formerly 36.383) (4 q.h.)

A continuation of 36.410. *Prereq.* 36.410.

36.412* Practicum in Sign Language Interpreting 3 (formerly 36.384) (4 q.h.)

A continuation of 36.411. *Prereq.* 36.411.

37: Speech Communication

Consultant: Prof. M. L. Woodnick, Speech Communication Dept. (College of Arts and Sciences)

37.301 Effective Communication 1* (formerly Effective Speaking 1) (3 q.h.)

Focus on development of personal communication skills, shaping messages, sending messages, listening, understanding nonverbal cues, trusting and coping with the barriers to communication, feedback and interaction.

37.302 Effective Communication 2* (formerly Effective Speaking 2) (3 q.h.)

The focus is on small-group communication, elements of group structure, task and maintenance functions by group members, leadership, formalized methods of group problem solving, and decision making.

37.303 Effective Communication 3* (formerly Effective Speaking 3) (3 q.h.)

The study and application of public communication skills, both as disseminating information and as a catalyst for change; message preparation; information exchange; delivery. Persuasive techniques are emphasized.

37.304 Voice and Articulation 1 (3 q.h.)

Aimed at developing the speaking voice; special emphasis on articulation, pitch control, vocal variety, and flexibility; basic theory of the vocal mechanism.

37.305 Voice and Articulation 2 (3 q.h.)

Study of the science of speech sounds, investigation of regionalisms, individual voice development. *Prereq.* 37.304.

37.306 Oral Interpretation (3 q.h.)

Application of basic vocal techniques to the dramatic interpretation of various forms of literature.

37.307 Business and Professional Speaking (3 q.h.)

Practice in the organization and presentation of material to fit varying audiences. Emphasis on techniques of delivery and effective presentation of ideas.

37.308 Argumentation and Discussion (3 q.h.)

Designed to acquaint the student with the basic concepts of argumentation (evidence, research, refutation). Emphasis is placed on the psychology of an audience and various types of group discussion.

37.309 Parliamentary Procedure (3 q.h.)

Methods of conducting and organizing meetings, development of effective leadership techniques, experience in chairing a meeting and applying rules of order.

37.315 Effective Communication (Intensive) (6 q.h.)

Equivalent of 37.301 and 37.302, Effective Communication 1 and 2.

37.316 Oral Collaboration (3 q.h.)

Development of interviewing skills as a data acquisition technique. Effective questioning techniques to probe for technical information. How to interact with consultants, in formal and informal settings, for maximum benefit; make oral presentations and establish credibility among professional peers; participate in meetings for maximum productivity and effective technical group interaction.

37.327 Interpersonal Communications 1 (3 q.h.)

Ways of becoming more aware of one's self and one's relation to others. An exploration of various options for communicating and increasing one's knowledge of the group process (enrollment limited).

37.328 Interpersonal Communications 2 (3 q.h.)

A continuation of 37.327 *Prereq.* 37.327 (enrollment limited).

37.329 Interpersonal Communications 3 (3 q.h.)

A continuation of 37.328 *Prereq.* 37.328 (enrollment limited).

37.330 Female/Male Communication 1 (3 q.h.)

Analyzes the ways in which female/male relations are created, maintained, developed, or disintegrated through communications. The influence of family, friends, the media, and "significant others" in sustaining stereotypes for both sexes and the impact of such stereotyping on the self and effective communication. The use of verbal and nonverbal communications to understand the types of relationships between men and women, and how different male/female language styles and usage affect these relations.

37.331 Female/Male Communication 2 (3 q.h.)

Discusses interaction and transactional approaches to analyzing existing relations and their communication. Develops skills in diagnosing communication transactions and in developing strategies for successful or effective communication. The influence of supportive and defensive environments and the communication behav-

iors of each are examined and applied to strategies for improving relationships between males and females. *Prereq.* 37.330.

37.332 Female/Male Communication 3 (3 q.h.)

Problems and issues in male/female communication. Various settings (job or work environment, industry, health professions, education, family, legal) are used, and the problems and issues of male/female interactions through communication are examined. Issues and problems from participants' own experience, as well as case studies, are included. *Prereq.* 37.330, 37.331.

37.333 Self-Concept and Communication (3 q.h.)

Designed to look at ways communication patterns are formed and work in our personal and professional lives. Emphasis on how self-concept affects communication. Using a combination of thinking, feeling, and doing, students can develop awareness of their attitudes and habits and explore alternative communication patterns.

37.334 Listening (3 q.h.)

This course helps students identify their unique listening styles and explore ways in which predominant listening patterns can become more flexible. Areas to be covered include reasons for poor listening, techniques for effective listening, giving and receiving feedback.

37.335 Interviewing (3 q.h.)

A course designed to further the student's understanding of the dynamics of interviews by presenting fundamental communication principles and showing how they apply to the interview process. This course examines these principles from the perspective of both the interviewer and the interviewee, helping students to prepare for both roles. Special attention is given to employment, informational, counseling, and persuasive interviews.

37.364 Speaking Skills for International Students 1 (3 q.h.)

Beginning-level course designed for persons who have studied or are studying English. Instruction offered in pronunciation and intelligibility for formal and informal situations. Communication skills monitored through use of video and audio tape recordings and work in the language laboratory. Following diagnostic testing, students will participate in individualized, small- and large-group instructional situations. Placement tests will be given during the first week of class.

37.365 Speaking Skills for International Students 2 (3 q.h.)

Intermediate-level course designed for persons who have previously studied English but who need to develop additional basic oral communication proficiency. Communication skills monitored through use of video tape and audio tape recordings and work in the language laboratory. Following diagnostic testing, students will participate in individualized, small- and large-group instructional situations. Placement tests will be given during the first week of class.

37.366 Speaking Skills for International Students 3 (3 q.h.)

Advanced-level course designed for students who have previously studied English and who can make themselves understood easily, but who have difficulty in purposeful oral communication. Task-oriented interaction, variety of two-person communication situations, and small-group interactions. Progress monitored through use of video and audio tape recordings. Placement tests will be given during the first week of class.

38: Journalism: Public Relations and Advertising

Consultant: Prof. Larue W. Gilleland, Chairman, Department of Journalism, College of Arts and Sciences.

38.304 Fundamentals of Newswriting* (formerly Newswriting I) (3 q.h.)

Obtaining and organizing facts; the writing of basic news stories. Subjects covered may include the five "W's" and the "H" of news, inverted pyramid form, news values, and leads.

38.305 Newsgathering and Reporting* (formerly Newswriting II) (3 q.h.)

Analysis of different types of news stories through assignments and class discussions, building news stories, news interview stories and other types. *Prereq.* 38.304 or equiv.

38.306 Reporting the News* (formerly Newswriting III) (3 q.h.)

Investigative reporting, feature stories, editorials. Copy-editing exercises and assignments in specialized writing. Libel, slander, and other legal matters affecting journalism. *Prereq.* 38.305 or equiv.

38.320 Photo Journalism (3 q.h.)

Covers the basics of how to tell a story with a camera. Elementary darkroom procedures are covered, including cropping, assignment techniques, classroom theory, and photo caption methods. Class size is limited. (\$15 Laboratory fee)

38.325 Advertising Basics (3 q.h.)

Study of the research, planning, creative, and media functions of advertising and how they interrelate. Application of advertising principles to consumer, retail, political, and other ad campaigns.

38.330 Public Relations Basics* (formerly Mass Media and PR) (3 q.h.)

Study of the concepts, components, and methods of public relations, including planning and research, processes of influencing public opinion, policies concerning corporate and institutional relations with the media and various publics.

38.331 Public Relations Practices* (formerly PR Practices and Production) (3 q.h.)

Specific practices and techniques employed in public relations, especially in relation to information handling

and organization of activities and events; how to define PR "targets"; analysis of dealing with publics such as employees, stockholders, consumers.

39.332 Public Relations Problems* (formerly PR Problems and Practices) (3 q.h.)

Research and communication techniques used to solve public relations problems; practical experience with individual PR projects, programs, and campaigns.

39.340 Newspaper/Magazine Economics and Management (3 q.h.)

Examination of the management structures and business priorities of newspapers and magazines. The interaction and interdependence of the editorial, administrative, advertising, production, and circulation departments. The economic role of print media in the community.

39: Economics

Consultant: Prof. M. A. Horowitz, Chairman, Economics Dept. (College of Arts and Sciences)

Associate Consultant: Prof. H. Goldstein, Executive Officer, Economics (College of Arts and Sciences)

39.301 Economic Principles and Problems 1 (3 q.h.)

Development of macroeconomic analysis; review of national income concepts; national income determination, fluctuation, and growth; role of the banking system and the Federal Reserve System; government expenditures and taxation; international trade; balance of international payments.

39.302 Economic Principles and Problems 2 (3 q.h.)

The role of a market pricing system, demand and supply in determining the allocation of resources to competing uses and why this system may not function adequately in certain areas. Application of economic principles to private and public problems in such areas as pollution, poverty, and racial discrimination. *Prereq.* 39.301 or *equiv.*

39.303 Economic Principles and Problems 3 (3 q.h.)

Applications of economic principles to selected problem areas: poverty, competition, labor, agriculture, urban. *Prereq.* 39.302 or *equiv.*

39.304 Economics (Intensive) (9 q.h.)

Combination of Economic Principles and Problems I, II, and III. (Not open to students who have taken 39.301, 39.302, 39.303.)

39.307 Intermediate Economic Theory 1 (3 q.h.)

A detailed study of supply and demand analysis, various elasticity concepts and applications, theory of consumer demand, theory of production, and derivation of cost curves. Detailed analysis of pricing and output behavior in the several market structures with their welfare implication; the pricing of resources. *Prereq.* 39.303 or *equiv.*

39.308 Intermediate Economic Theory 2 (3 q.h.)

Investigation of the conceptual and empirical problems of creating and using national accounts; price index problems, conceptual and empirical evaluation of several consumption and investment functions, and their policy implications; multiplier and accelerator models; a brief history of recent cyclical fluctuations. Analysis of inflation and growth theories in the light of recent economic history. *Prereq.* 39.307 or *equiv.*

39.309 Intermediate Economic Theory 3 (3 q.h.)

Continuation of 39.307 and 39.308. Introduction to mathematical analysis and comprehensive analysis of theory of distribution. *Prereq.* 39.308 or *equiv.*

39.311 Statistics 1 (3 q.h.)

Introduction to the collection and organization of data. Topics include the measurement, presentation, and uses of measures of central tendency and variability, elementary set theory, basic probability, and probability distributions.

39.312 Statistics 2 (3 q.h.)

Topics include sampling and basic estimation techniques, "t" distribution, testing statistical hypotheses, and analysis of variances. *Prereq.* 39.311 or *equiv.*

39.313 Forecasting and Other Topics in Statistics* (formerly Statistics 3) (3 q.h.)

This course focuses on the methods of econometric estimation and forecasting. Topics include linear regression analysis and correlation analysis. Other topics discussed include time series analysis and index numbers. *Prereq.* 39.312 or *equiv.*

39.314 Statistics (Intensive) (9 q.h.)

A combination of 39.311, 39.312, and 39.313.

39.317 Money and Banking 1 (3 q.h.)

Introduction to money and credit, commercial banking structure, and money creation; problems and policy of central banking in the United States. *Prereq.* 39.303 or *equiv.*

39.318 Money and Banking 2 (3 q.h.)

Theory of money and prices and monetary policy; interest theory, debt management, and international monetary problems and analysis. *Prereq.* 39.317 or *equiv.*

39.319 Government Finance (formerly Public Finance) (3 q.h.)

Fiscal functions, institutions, and politics; growth of the public sector, expenditure planning in theory and practice; cost-benefit analysis; principles of taxation and tax incidence; major taxes at Federal and state-local levels; fiscal policy for high employment, price stability, and growth; current fiscal problems such as tax reform, urban fiscal problems, fiscal federalism, and income maintenance programs. *Prereq.* 39.318 or *equiv.*

39.321 Economic Growth and Development 1 (3 q.h.)

Analysis of the development of the Western market system. Introduction to economic growth and alternative approaches to economic development.

39.322 Economic Growth and Development 2 (3 q.h.)

An introductory analysis of economic factors and institutions, as well as an examination of the effect of psychological, social, and political influences upon economic development.

39.323 Government and Business 1 (3 q.h.)

Role of government in national economic affairs—theory and practice.

39.324 Government and Business 2 (3 q.h.)

The relation between government and business; anti-trust laws.

39.325 American Economic History (3 q.h.)

Economic development of the United States, with emphasis upon the post-Civil War period and selected European developments.

39.326 Government and Business 3 (3 q.h.)

Application of anti-trust laws to business—emphasis on cases, principles, and current anti-trust problems.

39.327 Labor Economics (3 q.h.)

Development of labor organizations, their aims and methods. Issues in collective bargaining and public policy toward labor. *Prereq.* 39.303 or *equiv.*

39.328 International Economics 1 (3 q.h.)

Economics of international trade, tariffs and resource use, and balance of payments mechanisms. *Prereq.* 39.303 or *equiv.*

39.329 International Economics 2 (3 q.h.)

International commercial policy, financial organizations, and recent problems. *Prereq.* 39.328 or *equiv.*

39.330 Comparative Economic Systems (3 q.h.)

Competing types of theoretical economic systems; analysis of organization and operation of currently existing types of communist, socialist, and capitalist economies; comparison and evaluation of economic behavior and performance of different economic systems.

39.331 Business Cycles 1 (3 q.h.)

Intermediate macroeconomic theory. Theory of cyclical fluctuations in the context of multiplier and accelerator models. *Prereq.* 39.303 or *equiv.*

39.332 Business Cycles 2 (3 q.h.)

Business cycle analysis, measurement, and public policy. *Prereq.* 39.331 or *equiv.*

39.333 Business Cycles 3 (3 q.h.)

Business cycle forecasting methods and services. *Prereq.* 39.332 or *equiv.*

39.334 Business Cycles (Intensive) (9 q.h.)

Combination of 39.331, 39.332, 39.333.

39.336 Advanced Statistics 1 (3 q.h.)

Advanced topics in sampling statistical inference as a management aid. *Prereq.* 39.303, 39.313 or *equiv.*

39.337 Advanced Statistics 2 (3 q.h.)

Elements in probability theory and the decomposition of economic change into secular, seasonal, and cyclical variation. *Prereq.* 39.336 or *equiv.*

39.338 Advanced Statistics 3 (3 q.h.)

Advanced topics in statistical inference, regression, and correlation and index numbers. *Prereq.* 39.337 or *equiv.*

39.339 Managerial Economics (3 q.h.)

An application of the theory of demand, price, and output to the business firm and capital budgeting. *Prereq.* 39.303 or *equiv.*

39.341 Medical Economics (3 q.h.)

Examination and discussion of the following topics: health care trends in the United States; causes for increases in medical care costs; supply and training of health care personnel; the nation's need for physicians, nurses, pharmacists, and other allied health personnel; the quality of medical care; economics of health insurance plans; consumer demand for health care, medical facilities, professional personnel, and semiprofessional personnel.

39.342 Economics of Crime (3 q.h.)

Theoretical and empirical analysis of the economic causes of criminal behavior will be presented. The social costs of crime and its prevention will be covered, and techniques for designing optimum law enforcement policies will be developed.

39.343 Poverty and Discrimination (3 q.h.)

Analysis of trend and composition of poverty in America. Examination of labor market, demographic and institutional forces contributing to poverty; role of education; economics of race and sex discrimination; public welfare system and proposed reforms.

39.351 Industrial Organization and Public Policy (3 q.h.)

The theoretical framework for analysis and evaluation of the static and dynamic performance of real markets. An examination of the empirical studies testing the usefulness of applying theory to real markets. An examination of antitrust as a public policy designed to promote better market performance. *Prereq.* 39.303 or *equiv.*

39.352 Economics of World Energy and Primary Resources (3 q.h.)

Investigates economic, political, and historical backgrounds of the energy and other resource problems. Future impact of primary resource limitations on U.S.

and world economics will be analyzed. Feasibility studies of resource substitution.

39.353 Superpower Economics (3 q.h.)

Analyzes the relative economic structure and strength of the U.S., U.S.S.R., Japan, the Common Market, and China, as well as the economic relations among these powers. Also may examine the impact of these relations on the domestic economies of the superpowers and of the developing nations of the world.

39.354 Economics of Urban Transportation (3 q.h.)

Transportation and land-use patterns; externalities; social costs and social benefits of various modes of urban transportation; ownership, regulations, and financing of various modes of transportation; economies of new technology in urban transportation.

39.355 Economics of the Quality of Urban Environment and Control (3 q.h.)

Economic analysis of air, water, thermal, and noise pollution; the utilization of urban space and other urban resources; identification of possible economic effects of urban environment, such as crime, delinquency, immobility, and congestion.

39.357 Manpower and Anti-Poverty Policies and Programs (3 q.h.)

Assessment of government and private efforts to fight poverty and improve the labor market position of impoverished groups; relation between causes of poverty and discrimination; and possible remedies. Manpower training programs, negative income tax, family allowances, and other income maintenance schemes.

39.361 Urban Economics (3 q.h.)

An inquiry into the causes of the location and the growth of urban centers; economic analysis of selected urban problems, such as housing, transportation, land use, and public services. Exploration of public policies related to such problems.

39.381 Economic Policy Seminar (3 q.h.)

Capstone course for senior majors with stress upon independent study and contemporary issues. *Prereq.* 39.303, 39.331 or *equiv.*

39.391 Honors Program 1 (4 q.h.)

Prereq. Approval of the Dean.

39.392 Honors Program 2 (4 q.h.)

Prereq. 39.391.

39.393 Honors Program 3 (4 q.h.)

Prereq. 39.392.

39.491 Directed Study 1 (3 q.h.)

An opportunity for qualified students to take an upper-level course in their major area on an individual basis. Petitions and procedural instructions are available in the office of University College Social Science Programs, 204 Churchill Hall, 617-437-2416. *Prereq.* 87 q.h.

39.492 Directed Study 2 (3 q.h.)

An opportunity to initiate a second individual study as described above. *Prereq.* 39.491.

40: Library Science

Consultant: Mr. Frank Seegraber, Boston College

40.301 Introduction to Library Science (3 q.h.)

Brief survey of the history of books and librarianship. The development of libraries in the United States, with some emphasis on recent Federal and state library legislation. The library profession, its philosophy, publications, and organizations.

40.302 Selection of Library Materials (3 q.h.)

Principles and practices in the selection of materials for the modern library, bibliographic aids to selection, practice in preparation of book notes and book reviews.

40.310 Critical Research Tools (3 q.h.)

How to start on a research project. Opportunity to develop academic competence and efficiency via the mastery of basic reference materials. Covers the use of a wide variety of research tools to make the most effective use of available study time and to improve academic performance. How to get the most out of dictionaries, encyclopedias, almanacs, yearbooks, atlases, newspapers, periodicals, indexes, reviews, biographical sources, print and nonprint formats (e.g., microfiche, computer banks, film strips).

40.311 Organization of the Library (3 q.h.)

The organization, administration, and services of municipal libraries; public library systems in the United States; the role of public libraries as educational institutions.

40.312 Multi-Media Centers (3 q.h.)

Organization and management of elementary and secondary school libraries, problems in the selection and evaluation of multi-media materials necessary to the school curriculum.

40.313 Administration of Multi-Media Centers (3 q.h.)

The library as a media center for instructional materials, problems in personnel and budgeting, the library's role in curriculum and services to students and faculty.

40.314 Multi-Media Materials and Services (3 q.h.)

The selection, organization, and use of multi-media materials in school libraries; types of library equipment and services; cataloging of school library materials.

40.321 Introduction to Reference Materials and Methods (3 q.h.)

The basic tools and methods for locating information. Evaluation of dictionaries, encyclopedias, gazetteers and atlases, handbooks, almanacs, directories, and indexes.

40.322 Reference Work in the Social Sciences (3 q.h.)

Scope and use of outstanding reference materials, including government publications, in the broad range of the social sciences: economics, education, political science, sociology, and allied fields. *Prereq.* 40.321 or *equiv.*

40.323 Reference Work in the Humanities (3 q.h.)

Approaches to the solution of reference problems in the humanities, with special emphasis on literature. *Prereq.* 40.321 or *equiv.*

40.325 Business Research Tools (3 q.h.)

Assists the business student or professional in becoming familiar and adept in the use of the most respected publications and information sources in the business community. Content relates to such areas as business law, accounting, finance, marketing, statistics, computers, and data bases. Students are given a series of reference assignments to learn where to go, and how to dig out and understand complex data for the answers. Helps students to develop an overall command of key business information tools.

40.331 Descriptive Cataloging (3 q.h.)

Theory and practice of descriptive cataloging; introducing techniques of compiling author, corporate, and serial entries.

40.332 Subject Headings and Classification (3 q.h.)

Introduction to Dewey Decimal Classification and Sears subject headings; further study of descriptive cataloging in book and nonbook materials. *Prereq.* 40.331 or *equiv.*

40.333 Library of Congress Classification (3 q.h.)

The significant differences between LC and Dewey. Notes on original cataloging and techniques of classification within the LC scheme. Exercises in the use of LC schedules and subject headings. *Prereq.* 40.331 or *equiv.*

40.341 Children's Library Materials: An Evaluation (3 q.h.)

The history of children's literature; current trends in its publication and social forces that influence its production; criteria for evaluation and aids for selection of types of children's books.

40.342 Library Service to Young People (3 q.h.)

Study of adolescent needs in the field of literature, with application to both public and school libraries; special attention to the problem of material selection, book talks, and discussion groups.

Arts and Sciences Intensive Courses**16.304 Earth Sciences (Intensive)** (9 q.h.)

A composite of 16.301, 16.302, and 16.303, as a one-quarter course.

19.307 Psychology (Intensive) (9 q.h.)

An introductory survey of the historical backgrounds of psychology, psychological measurement and testing, and principles of animal and human learning. Principles of sensory processing, perception, motivation and emotion, and social influences on behavior. Personality theory and measurement, behavior disorders, mental health, and psychotherapy. *(Not open to students who have taken 19.301, 19.302, 19.303.)*

19.344 Abnormal Psychology (Intensive) (9 q.h.)

Same as 19.341, 19.342, 19.343. *Prereq.* 19.303 or *equiv.*

20.304 Anthropology (Intensive) (9 q.h.)

Same as 20.301, 20.302, and 20.303.

21.304 Sociology (Intensive) (9 q.h.)

Basic concepts and theories relating to the study of humans as participants in group life. Examines social structure, culture, socialization, the family, primary groups, associations, social stratification, collective behavior, population, and problems of social, political, urban, and industrial change. Term papers or essays may be required. *(Not open to students who have taken 21.301, 21.302, 21.303.)*

21.417 Social Theory 1 (Intensive) (4 q.h.)

A historical survey of sociological theorists, including the work of Tocqueville, Comte, Marx, Durkheim, Cooley, Weber, Simmel, and others. *Prereq.* *Consent of the instructor* or 12 q.h. in *Sociology-Anthropology*. *(Not open to students who have credit for 21.317, 21.318, or 21.319.)*

21.418 Social Theory 2 (Intensive) (4 q.h.)

A study of the major theoretical issues in sociology. Discussion concentrates on systematic questions and topics, but material is drawn from theorists such as Mannheim, Merton, Parsons. Students may be required to present papers in class on questions of theoretical interest, e.g., the problem of order, the problem of change, the role of the individual in change. *Prereq.* 21.417 or *equiv.* *(Not open to students who have credit for 21.317, 21.318, or 21.319.)*

22.321 Public Administration (Intensive) (6 q.h.)

Same as 22.316 and 22.317.

22.329 Comparative Politics (Intensive) (4 q.h.)

A comparative analysis of political culture, organization, and behavior in different national settings.

37.315 Effective Communication (Intensive) (6 q.h.)

Equivalent of 37.301 and 37.302, Effective Communication 1 and 2.

30.313 Business Writing and Reports (Intensive) (6 q.h.)

A combination of 30.311 and 30.312.

30.412 Technical Writing (Intensive) (6 q.h.)

The equivalent of 30.410 and 30.411, Technical Writing 1 and 2.

39.304 Economics (Intensive) (9 q.h.)

Combination of Economic Principles and Problems 1, 2, and 3. (*Not open to students who have taken 39.301, 39.302, 39.303.*)

39.314 Statistics (Intensive) (9 q.h.)

Introduction to the collection and organization of data. Concentration on the nature, computation, and uses of measures of central tendency and variability. Introduction to statistical inference, parameters of samples, tests of significance, "t" distribution, and chi square. Introduction to the analysis of variance, trend fitting, linear regression, seasonal adjustment, and index numbers. (*Not open to students who have taken 39.311, 39.312, 39.313.*) *Prereq.* 39.303 or equiv.

39.334 Business Cycles (Intensive) (9 q.h.)

Combination of 39.331, 39.332, 39.333.

Business Administration

41: Accounting

Consultant: Prof. Paul A. Janell (College of Business Administration) (437-4645)

Associate Consultant (Accounting Principles): Dean Walter E. Kearney, Jr. (Northeastern University) (437-2312)

Associate Consultant: Prof. Richard Keith (College of Business Administration) (437-4650)

41.301 Accounting Principles 1 (3 q.h.)

The basic concepts and methodology of accounting for service and merchandising businesses, and accounting for business assets.

41.302 Accounting Principles 2 (3 q.h.)

Emphasizes financial reporting, income measurement, valuation and appraising the financial results of business operations. *Prereq.* 41.301.

41.303 Accounting Principles 3 (3 q.h.)

The preparation and interpretation of cost accounting information and utilization of the information in the managerial decision-making process. Topics include cost-accounting systems, analysis of cost-volume relationships, fixed and variable costs, break-even analysis, standard costs, budgeting for planning and control, and capital budgeting. *Prereq.* 41.302.

41.304 Accounting Principles (Intensive) (6 q.h.)

Same as Accounting Principles 1 and 2.

41.315 Management Accounting for Nonprofit Organizations* (formerly 41.310) (3 q.h.)

An examination of the characteristics of management control in nonprofit organizations. A study of input-out-

put measures, pricing, budgeting, and accounting controls. (For nonaccounting majors) *Prereq.* 41.302.

41.401 Intermediate Accounting 1 (3 q.h.)

A comprehensive examination of the accounting process and the financial statements generated by that process. The focus is on current assets. Specific topics include cash, receivables, investments in marketable securities, and inventories. *Prereq.* 41.303.

41.402 Intermediate Accounting 2 (3 q.h.)

A continuation of 41.401. A detailed examination of current liabilities; fixed assets, including depreciation; intangible assets; and stockholder equity accounts. *Prereq.* 41.401.

41.403 Intermediate Accounting 3 (3 q.h.)

A comprehensive examination of some specialized problem areas relating to the preparation and interpretation of financial statements. Topics may include earnings per share, statement of changes in financial position, accounting changes, bonds payable, and long-term investments. *Prereq.* 41.402.

41.407 Intermediate Accounting 4* (formerly Advanced Accounting 1) (3 q.h.)

An in-depth analysis of specialized problem areas in accounting. Topics may include price-level accounting, accounting for income taxes, accounting for pensions and leases. *Prereq.* 41.403.

41.404 Intermediate Accounting (Intensive) (6 q.h.)

Same as 41.402 and 41.403. *Prereq.* 41.302.

41.405 Cost Accounting 1 (3 q.h.)

The foundations of cost accounting, including terminology, purpose, and relationship with financial accounting; familiarization with product costing systems and their usefulness. *Prereq.* 41.303.

41.406 Cost Accounting 2 (3 q.h.)

Budgetary planning and control, with emphasis on the use of cost data for current operations, special decisions, and long-range planning. *Prereq.* 41.405.

41.421 Cost Accounting (Intensive) (6 q.h.)

Same as 41.405 and 41.406. *Prereq.* 41.303.

41.408 Advanced Accounting 1* (formerly Advanced Accounting 2) (3 q.h.)

A comprehensive examination of the problems associated with business combinations. A study of the purchase and pooling methods of consolidations. *Prereq.* 41.407.

41.409 Advanced Accounting 2* (formerly Advanced Accounting 3) (3 q.h.)

A study of the accounting problems associated with partnerships, installment sales and consignments, and multinational corporations. A detailed examination of accounting for "not-for-profit entities." *Prereq.* 41.408.

41.410 Seminar in Contemporary Accounting**Problems 1 (3 q.h.)**

The careful examination of the underlying concepts and conventions of accounting and their application to financial statements. An in-depth analysis of the areas of revenue and income recognition. *Prereq.* 41.406 and 41.407.

41.411 Seminar in Contemporary Accounting**Problems 2 (3 q.h.)**

The examination of cost determination and allocation and depreciation. An in-depth study of specialized areas, including such topics as pensions, leases, stock options, and earnings per share. *Prereq.* 41.410.

41.412 Auditing 1 (3 q.h.)

The examination of auditing requirements relative to the professional ethics and legal responsibility of the certified public accountant. A study of the use of the computer in auditing and the utilization of statistical sampling techniques. *Prereq.* 41.403.

41.413 Auditing 2 (3 q.h.)

The methods and approaches utilized in auditing aspects, liabilities, owners' equity, and nominal accounts of the firm. *Prereq.* 41.412.

41.414 Auditing (Intensive) (6 q.h.)

Same as 41.412 and 41.413. *Prereq.* 41.403.

41.415 Federal Income Taxes 1 (3 q.h.)

The application of the federal tax laws to the individual's income, gains, losses, and expenses. A study of the individual's special deductions. *Prereq.* 41.403.

41.416 Federal Income Taxes 2 (3 q.h.)

A study of some specialized tax problems related to the individual. Topics include installment sales and income averaging. A study of the application of the federal tax laws to the corporation. *Prereq.* 41.415.

41.417 Internal Auditing 1 (3 q.h.)

Designed to aid in understanding how a modern internal audit function reviews and appraises diverse operations. Studies the audit organization, selection, and development of staff, preparation of long-range programs, performing preliminary surveys, and developing audit programs. Techniques of internal audit appraisal are examined. Topics may include regression analysis and statistical sampling. Case studies may be employed. *Prereq.* 41.403.

41.418 Internal Auditing 2 (3 q.h.)

Continuation of the study of techniques of internal audit appraisal. Topics may include computers as an audit tool, auditor responsibilities, audit work papers, reports, reviews, replies, and management summaries. Case studies are employed. *Prereq.* 41.417.

41.420 Essentials of Personal Income Taxation (3 q.h.)

A special course designed for those students who are not majoring in accounting. The course is designed to

teach important aspects of personal income taxation on both the federal and state levels. Tax laws, tax planning, and the preparation of individual tax returns are emphasized.

41.422 Federal Income Taxes 3 (3 q.h.)

A study of the application of the federal tax laws to the corporation. *Prereq.* 41.416.

43: Marketing

Consultant: Prof. Dan T. Dunn, Jr. (College of Business Administration) (437-4563)

Associate Consultant: Mr. George S. Hennessy (890-8045)

43.301 Introduction to Marketing 1 (3 q.h.)

Focuses on the role of marketing in contemporary economic society, in the business enterprise, and in non-profit organizations such as hospitals and government agencies. Consideration is given to the planning, operation, and evaluation of marketing and promotional efforts necessary to the effective marketing of consumer and industrial products and services in both profit and nonprofit organizations. Students taking this course are strongly urged to continue instruction by also taking Introduction to Marketing 2, 43.302 (see below).

43.302 Introduction to Marketing 2 (3 q.h.)

Continuation of 43.301, with emphasis on pricing, distribution channels, product planning, packaging, branding, physical distribution, advertising, sales promotion, and sales force management leading to the development of overall marketing strategies. Case studies of actual marketing problems are used. *Prereq.* 43.301.

43.303 Introduction to Marketing (Intensive) (6 q.h.)

One-quarter course covering the material in Introduction to Marketing 1 and 2, 43.301 and 43.302.

43.310 Advertising and Sales Promotion Management 1 (3 q.h.)

Detailed examination of the use of advertising and sales promotion techniques as communications elements within a marketing strategy. *Prereq.* 43.302.

43.311 Advertising and Sales Promotion Management 2 (3 q.h.)

Continuation of 43.310. Case studies and projects are used to provide training in the development of creative advertising and promotion strategies and in the use of various communications media such as television, radio, and print. *Prereq.* 43.310.

43.313 Marketing Research 1 (3 q.h.)

The use of marketing research as a tool in planning, controlling, and evaluating marketing activities, including an introduction to the application of behavioral and quantitative concepts in the making of marketing decisions and the management of marketing programs. *Prereq.* 43.302.

43.314 Marketing Research 2 (3 q.h.)

Techniques of data collection and analysis in marketing research, forecasting, product planning, sales control, test marketing, marketing evaluation, and marketing information systems. *Prereq.* 43.313.

43.315 Marketing and Sales Seminar (3 q.h.)

Capstone marketing elective, focusing on the formulation and implementation of overall marketing strategy. *Prereq.* 43.314.

43.316 Public Relations 1 (3 q.h.)

An introduction to and overview of the basic principles, purposes, and methods of public relations in both profit and nonprofit organizations. Also includes discussion of community relations and employee relations.

43.317 Public Relations 2 (3 q.h.)

Continuation of 43.316. Specific training in the development of public relations programs and the overall management of the public relations function in an organization. *Prereq.* 43.316.

43.318 Introduction to Advertising (3 q.h.)

Especially for the nonmarketing (including nonbusiness) concentrator, although marketing concentrators may take the course. Focuses on advertising as a business tool as well as a force in society.

43.319 Retail Management 1 (3 q.h.)

Detailed examination of the concepts and techniques of store operations and merchandise management. Focuses on the activities and contributions of the various retailing institutions: independents and chains, dealerships, specialty stores, fashion stores, department stores, supermarkets, discount stores, franchises, etc. Topics include retail management, retail profit and loss, starting a retail business, store location, store planning, and the retail organization. *Prereq.* 43.302.

43.320 Retail Management 2 (3 q.h.)

Continuation of 43.319, with stress upon store operations, merchandising planning and control, merchandise management, pricing, buying, sales promotion, customer service, retail accounting, and expense management. *Prereq.* 43.319.

43.322 Sales Management 1 (3 q.h.)

Detailed examination of the use of the sales force as an element of marketing strategy. Selection, training, development, organization, and supervision of the sales force. *Prereq.* 43.302.

43.323 Sales Management 2 (3 q.h.)

Continuation of 43.322, with emphasis on the supervision and evaluation of the sales force. Also, role of personal selling within various marketing programs. Case studies used extensively. *Prereq.* 43.322.

43.324 Consumer Behavior (3 q.h.)

Concerned with developing an understanding of consumer attitudes and behavior processes as the basis of the design of marketing programs. Consideration is

given to economic and behavioral models of consumer behavior and to underlying behavioral theories and concepts. *Prereq.* 43.302.

43.326 International Marketing (3 q.h.)

Concentrates on the opportunities and challenges facing the international marketing executive; the decision-making process in marketing goods abroad; the environmental forces—economic, cultural, and political—affecting the marketing process and acting as constraints on the development of marketing strategies abroad; financing international operations. *Prereq.* 43.302.

43.330 Advertising and Sales Promotion (Intensive) (6 q.h.)

One-quarter course covering the same material found in Advertising and Sales Promotion 1 and 2, 43.310 and 43.311. *Prereq.* 43.302.

43.331 Sales Management (Intensive) (6 q.h.)

One-quarter course covering the same material found in Sales Management 1 and 2, 43.322 and 43.323. *Prereq.* 43.302.

43.332 Retail Management (Intensive) (6 q.h.)

One-quarter course covering the same material found in Retail Management 1 and 2, 43.319 and 43.320. *Prereq.* 43.302.

43.334 Marketing Management 1 (3 q.h.)

An advanced case method course designed to develop the student's ability to analyze and make decisions about business problems that involve the creation, distribution, and sale of goods and services. Teaches the student how to establish and control marketing budgets. Emphasizes the definition of marketing problems, demand analysis, consumer analysis, and marketing research. Studies the role of the marketing manager. *Prereq.* 43.301.

43.335 Marketing Management 2 (3 q.h.)

A continuation of 43.334, with emphasis on the formulation and implementation of marketing strategy. Emphasis is placed on product policy, channels of distribution, pricing, advertising, personal selling, and the development of integrated marketing programs of action. *Prereq.* 43.334.

43.336 Marketing Management (Intensive) (6 q.h.)

One-quarter course covering the same material found in Marketing Management 1 and 2, 43.334 and 43.335. *Prereq.* 43.301.

43.337 Marketing and the Government (3 q.h.)

Focuses on the increasingly important legal and regulatory matters facing marketers. Specific attention is given to present and potential impact of laws and regulations on pricing, discounts, patents, copyrights, trademarks, distribution, product warranties, advertising claims, competitive actions, environmental impact, and consumer protection. *Prereq.* 43.302.

43.340 Professional Selling Skills (Intensive) (6 q.h.)

Development of the skills necessary for effective selling. Examines customer buying process and the steps in a company's sales process. Discusses prospecting, preparation, presentation, and postsale activities. Introduces advanced selling techniques such as team selling. Focuses upon situations where personal selling is a major element of marketing strategy, such as in industrial product, professional service, and high-technology marketing. *Prereq.* 43.302.

43.341 High-Technology Marketing (3 q.h.)

Focuses on the role of the company's marketing function in transforming technology into products. Discusses planning for product innovation, linkages between marketing and engineering, and communications strategies for marketing high-technology products. *Prereq.* 43.302.

44: Finance**Finance**

Consultant: Prof. Robert J. Hehre (College of Business Administration) (437-4642)

Associate Consultant: William F. Hancock, Jr. (496-9497)

Associate Consultant: Prof. Jonathan Welch (College of Business Administration) (437-4572)

44.301 Principles of Finance* (formerly Introduction to Financial Management) (3 q.h.)

A survey of the scope and nature of financial management, including forms of ownership and their effect on the division of risk, income, and control within the organization; the impact of taxes on financial decisions; financial statements and financial analysis; planning, budgeting, and controlling cash flows, including sources and uses of funds. Introduction to investments and investment management. *Prereq.* 39.302 and 41.302.

44.310 Financial Management 1 (3 q.h.)

Examines working capital policy and the management of current assets, major sources of short-term financing, interest factors in financial decisions, capital budgeting techniques, investment decisions under uncertainty, sources and forms of long-term financing. *Prereq.* 44.301.

44.311 Financial Management 2 (3 q.h.)

Financial structure, leverage, valuation, rates of return, and the cost of capital are examined, as well as dividend policy, internal financing, and timing of financial policy. It also reviews external growth and mergers, failure, reorganization, liquidation, and international finance. *Prereq.* 44.310.

44.312 Investment Principles* (formerly Investments 1) (3 q.h.)

This course offers an overview of concepts, practices, and procedures of investments. Reviews various types of investments, including the role of security markets and security analysis. *Prereq.* 44.301.

44.313 Investment Management* (formerly Investments 2) (3 q.h.)

Examines the relation between the economy and stock prices. Covers corporate analysis, earnings, dividends, and cash flow. Introduces portfolio analysis. Studies technical analysis vs. fundamental factors. *Prereq.* 44.312.

44.314 Credit Principles* (formerly Credit Management 1) (3 q.h.)

An introduction to credit and its functions. Examines the role of the credit executive, credit investigation, documentary credit, trade credit, and organization of the credit department. *Prereq.* 44.301.

44.315 Credit Management* (formerly Credit Management 2) (3 q.h.)

Various forms of credit and collection services. Analysis of financial statements, determination of credit worthiness. Creditors' rights, adjustment bureau operations, credit insurance and guarantees. *Prereq.* 44.314.

44.316 Budgeting and Planning* (formerly Profit Planning and Control 1) (3 q.h.)

An intensive treatment of managerial planning, budgetary control, and financial analysis. Studies interrelation between functional areas in an organization using consolidated profit planning as an integrating device. Course covers fundamental financial analysis, comprehensive profit planning, general expense planning, production planning, materials planning, purchasing. *Prereq.* 44.301.

44.317 Financial Control* (formerly Profit Planning and Control 2) (3 q.h.)

Course covers development and application of variable budgets, planning and controlling capital expenditures, computer applications in profit planning, cash flow planning and control, cost-profit-volume analysis, performance reporting, and analysis of budget variations. *Prereq.* 44.316.

44.318 Management of Financial Institutions 1 (3 q.h.)

A detailed examination of the role, diversity, and operation of the various financial institutions in our economy, including banking and related units; operating objectives, techniques, and services. *Prereq.* 44.301.

44.319 Management of Financial Institutions 2 (3 q.h.)

Investment objectives and asset management. Course examines liquidity, adequacy of capital, portfolio management and selection, including control and community relations. *Prereq.* 44.318.

44.320 Advanced Financial Management (3 q.h.)

A wider and more intensive investigation into the problems of financial management, with emphasis on decision making. Specific topics include inflation, competition for investment funds, financial control and problems of the divisionalized company, and the interrelated problems of creating and maintaining a capital structure. *Prereq.* 44.311.

44.322 Advanced Investment Management (3 q.h.)

Theories and practice of portfolio selection and management are explored. Course uses special cases and studies their resolution. Other topics include fund management and legal liability. *Prereq.* 44.313.

44.323 Seminar in Finance (3 q.h.)

An intensive analysis of current problems in finance. Student research and presentation of individual papers. *Prereq.* 44.311.

44.324 Seminar in Investments (3 q.h.)

An intensive analysis of current problems in investments. Student research and presentation of individual papers. *Prereq.* 44.313.

44.325 Personal Financial Management 1 (3 q.h.)

Development of the professional personal financial manager. Analysis of needs and objectives, personalities, limits, and constraints. Techniques for need fulfillment and cash management. *Prereq.* 44.301.

44.326 Personal Financial Management 2 (3 q.h.)

Individual aspects of personal financial plans. Impact of taxes and tax planning. Insurance, trust arrangements, estate planning. *Prereq.* 44.325.

44.327 Personal Financial Management (Intensive) (6 q.h.)

A one-quarter course covering the same material found in 44.325 and 44.326. *Prereq.* 44.301.

44.328 International Finance 1 (3 q.h.)

Introduction to international financial management in the multinational corporation. Analysis of basic problems and finance considerations involved with international investments, trade, and payments. Planning in the international environment related to exchange rates, currency revaluations, inflation, and local government policies. *Prereq.* 44.311.

44.329 International Finance 2 (3 q.h.)

Analysis of the financial strategy involved with international investment alternatives, sources of capital, working capital management, fund flows, and management control through accounting and financial reporting. *Prereq.* 44.328.

44.331 Financial Management (Intensive) (6 q.h.)

A one-quarter course covering the same material found in 44.310 and 44.311. *Prereq.* 44.301.

44.332 Investments (Intensive) (6 q.h.)

A one-quarter course covering the same material found in 44.312 Investment Principles and 44.313 Investment Management. *Prereq.* 44.311.

44.333 Consumer Finance (3 q.h.)

(Recommended for nonfinance majors and nonbusiness students; cannot be taken in Bachelor of Science in Business Administration degree program.) An extension of personal finance into the specific area of consumer finance. The course will give the student the opportunity to examine consumer installment sales laws, consumer protection statutes, financing practices of banks and other financing institutions. Activities of the consumer affairs offices of the Attorney General's and Banking Commissioner's departments and their influence on consumer finance will be analyzed. Attention will be focused on a practical interpretation of laws and practices dealing with contracts.

44.334 Personal Insurance Management (3 q.h.)

A survey of the types of insurance available to the individual consumer and how these measures can be used to protect against the financial consequences of loss of property, income, and life. Emphasis is placed on how insurance is used rather than on a technical analysis of the insurance process. Estate planning for individuals is stressed.

44.335 Risk and Insurance Management for Business (3 q.h.)

A broad survey of the various risks that confront the business manager and the various insurance alternatives that are available to meet those risks. Emphasis is placed on the use of insurance rather than on an analysis of the insurance mechanism. A detailed review of imposed insurance requirements, such as social security and OSHA, is included. *Prereq.* 44.301.

44.350 Commodities and Futures Markets (3 q.h.)

An investigation and study of commodities and futures markets, their objectives and operations, including hedging and speculation. Examines the role of banks and produce institutions in these markets and how they utilize various techniques in order to protect prices and positions. *Prereq.* 44.313 or permission of instructor.

45: Management

Consultant: Prof. Daniel McCarthy (College of Business Administration) (437-3232)

Associate Consultant: Mr. W. Arthur Gagne (799-4406 X 46)

Associate Consultant: Mr. Robert L. Goldberg (421-2602)

General Management
45.301 Introduction to Business and Management 1* (formerly Management and Organization 1) (3 q.h.)

Introduces the new businessperson to the setting and

general structure of American business, which includes objectives and practices as they affect the American standard of living. Examines the characteristics of private enterprise and the nature and challenge of capitalism and other forms of economic enterprise. The student is introduced to the forms of business, both large and small; to the structures of organizations and the functions of management as they tend to influence the various forms of business. Provides the opportunity for understanding what a career on the management level of organizations involves, what problems must be faced, and what decisions must be reached.

45.302 Introduction to Business and Management 2* (formerly Management and Organization 2) (3 q.h.)

Introduces the businessperson to methodologies in planning, organizing, directing, and controlling the functions of production, marketing, sales, and pricing as they relate to the American free enterprise systems and in contrast to other systems of international business. Examines modern, effective, and proven tools and techniques for coping with the myriad interrelations and intricacies of systems management. Develops a more comprehensive understanding of the total structure of business and other enterprises. *Prereq.* 45.301.

45.303 Introduction to Business and Management 3* (formerly Principles and Practices of Management) (3 q.h.)

Introduces the student from definitions and fundamentals of business to basic concepts relating to the functions of management and to the analytical techniques that are necessary to successful decision making. Emphasizes that management is a continuous process of action by introducing students to methods of designing an organization; understanding and dealing with people; evaluating the political, social, and economic environment; effectively planning, directing, and controlling the organization. Short cases and professional articles, included in the text, provide provocative material for discussion and reinforcement of management concepts. *Prereq.* 45.301.

45.305 Introduction to Business and Management (Intensive)* (formerly Management and Organization) (6 q.h.)

Combines Introduction to Business and Management 1 and 2, 45.301 and 45.302.

45.306 Project Planning and Control (3 q.h.)

Employs a systems approach to planning, scheduling, and controlling of large and small projects. The course is a combination of lectures and case studies that introduces and utilizes various tools and techniques, including bar charts, networks, critical path analysis, and an introduction to PERT. The course will assist the student in planning, scheduling, and allocating resources as a basis for controlling projects and comparing actual against planned performance. It is hoped that students will gain experience through their active participation in the case studies. *Prereq.* 45.301.

45.310 Business Policy 1* (formerly Management Decisions and Policies 1) (3 q.h.)

Organized as a capstone course for a business program, this course utilizes as its foundation all previous courses in management as well as numerous functional and process courses. It examines the total management process associated with the formulation and implementation of strategy for the entire enterprise, considering both management theory and practices. Deals with the development of corporate objectives, plans, and policies, with emphasis on the interaction between the enterprise and its environment. Both the economic and social responsibilities of business and managers are considered. *Prereq.* 100 q.h.

45.311 Business Policy 2* (formerly Management Decisions and Policies 2) (3 q.h.)

The organizational and administrative functions for converting strategic plans into corporate performance and achievements are considered. The concepts of strategic planning and implementation are explored from the perspective of the general manager; particular attention is given to examination and identification of the functions, responsibilities, styles, values, and organization relationships of enterprise top management. Cases are drawn from profit- and nonprofit-oriented enterprises of various sizes in diversified fields, operating within many different business environments, including international businesses. Students should plan to participate actively in class discussion of case studies. *Prereq.* 45.310.

45.312 Business Policy (Intensive) (6 q.h.)

Please refer to the course descriptions for Business Policy 1 and 2, 45.310 and 45.311. The contents of the intensive course are the same, except it is presented twice per week during a single quarter. *Prereq.* 100 q.h.

45.313 Management Seminar 1 (3 q.h.)

A broad interdisciplinary project utilizing one or more of the techniques of library research, field research, field surveys, and organizational audits. Students will have the opportunity to utilize the knowledge gained in earlier course work. *Prereq.* 45.311.

45.314 Management Seminar 2 (3 q.h.)

A continuation of 45.313. *Prereq.* 45.313.

45.315 Effecting Change (3 q.h.)

Applies managerial concepts and practices within policy or resource constraints to real-time operational situations. Recognizing that today's business manager must operate in an environment of accelerating change, the course considers current factual examples of changing situations and examines guidelines for their resolution. In addition, it explores the process by which the manager makes decisions dealing with the impact of change on the organization and its personnel. Utilizing actual problems confronting today's organizations, the student progressively investigates change stemming from actions of managers and other individual

contributors at all levels of the organization. This investigation attempts to determine the sources of change and alternative courses of action. The course develops a conceptual framework for handling change in one's own business career. *Prereq.* 45.303.

45.318 Motivation, Management, and Leadership (3 q.h.)

Designed to help the student to differentiate between management, as a conferred or elective post, and leadership as a combination of personal traits or qualities, as well as to evaluate the impact of various styles of leadership of management on human behavior. Important concepts of motivation will be introduced and analyzed. Each student will have an opportunity to develop an understanding of the working environment as containing a combination of these and other processes that influence both performance and outcome. The course work will be supported by readings from contemporary behavioral scientists. In addition, each student will undertake a research project and will report on it for group discussion and analysis. *Prereq.* 45.303.

45.323 Entrepreneurship and Small Business Management 1 (3 q.h.)

An introduction to the major aspects of managing a small business. Areas probed cover basic elements of entrepreneurship and initial phases of planning, including legal, financial, marketing, control organization, and management functions. To provide realism, actual cases involving small businesses will be used with background text. *Prereq.* 45.301.

45.324 Entrepreneurship and Small Business Management 2 (3 q.h.)

A follow-up to 45.323, intended for advanced business students. Emphasis will be placed on developing business plans, analyzing performance, problem identification, maintaining financial health, and planning for the future. Actual cases involving small businesses will be used in conjunction with background reading. *Prereq.* 45.323.

45.325 Entrepreneurship and Small Business Management (Intensive) (6 q.h.)

Same as 45.323 and 45.324. (*Not open to students who have taken those courses.*)

45.326 Advanced Management Seminar (3 q.h.)

This special-enrollment seminar is normally a continuation of a specific group project conducted during 45.313 and 45.314 and is offered only during the Spring quarter. The specific group project must be of major management significance and may take the form of research of a management issue, a management audit, or an organizational analysis, usually of a real company. Enrollment in the seminar is limited, and both enrollment and the project must be approved by the Area Consultant and the Program Director. A written statement of the project, along with a listing of students to be enrolled, must be submitted to the Area Consultant no

later than the fifth week of the Winter quarter for review and approval action. *Prereq.* 45.313 and 45.314.

45.327 Manager and Society (3 q.h.)

A course designed for managers and staff persons focusing on national and international issues and challenges confronting business and industry in their interrelationships with government, societies, and individuals. The course explores issues not only of changing work environments but of societal influences exerted by various constituencies creating factors/pressures that management takes into account when making business decisions within a context of corporate social responsibility. *Prereq.* 45.310.

45.330 International Business Management and Operations (3 q.h.)

Introduces the student to the principles and practices at work in international business. It provides a comparison of the differences between domestic and international business activities, responsibilities, and influences. Explores the impact on the traditional business, economic, social, political, and legal arenas caused by the need for businesses to operate in a multinational environment. Examines the differences in functional performance resulting from the influence of the "foreign" factor in the business equation. *Prereq.* 45.310.

Industrial Management

Consultant: Mr. Joel M. Rosenfeld (491-9253)

Associate Consultant: Mr. James D. Mukjian (451-4120)

45.400 Production Management 1 (3 q.h.)

Provides an introduction to the planning and control of operations, whether in a manufacturing, wholesaling, retailing, or institutional-governmental setting. Deals with the analytical methods employed, the design of the system, and the control devices for both quality and quantity.

45.401 Production Management 2 (3 q.h.)

Selected readings in modern production management techniques. Facilities planning and design, including plant layout, materials handling, and related equipment. *Prereq.* 45.400.

45.402 Production Management (Intensive) (6 q.h.)

Same as 45.400 and 45.401. (*Not open to students who have taken those courses.*)

45.403 Manufacturing Processes (3 q.h.)

Production processes and material selection in the production and manufacture of hard goods, including selection of best methods by study of casting, machinery, forming, joining, extrusion, finishing, and assembly. Analyzes advanced manufacturing processes, including mass production, numeric control, central vs. line layout systems, automated systems, computer control equipment and systems, equipment and machinery selection, and replacement policies.

45.404 Value Management (3 q.h.)

An organized technique for challenging costs by analyzing a product or method in terms of value, function, and costs without sacrificing essential quality.

45.405 Industrial Safety (3 q.h.)

A study of the organization and administration of a comprehensive accident-prevention program, including analysis of industrial hazards and accidents, corrective actions, and the responsibilities of all management echelons.

45.406 Methods Analysis, Motion and Time Study (3 q.h.)

Methods analysis and plant layout; work design, operation analysis, human-machine relationship; elements of motion and time study. Studies measurement techniques and application; as well as production standards development for job shop operations; applying curve, table, equation, nomograph, family, and multivariable techniques; and utilizing work sampling methods.

45.407 Operations Management (3 q.h.)

Develops student skills in analyzing and managing the operations of a manufacturing operation. Integrates the techniques and methods, both quantitative and qualitative points of view, and applies them to problems that arise in planning and controlling manufacturing and other operating systems.

45.409 Cases in Industrial Management (3 q.h.)

Cases describing particular operating situations as they are faced by managers in business in which the students base their analyses on an array of facts and judgments. The student will become aware of the skills the manager brings to bear on business problems requiring a diverse background of knowledge about the technologies and techniques of the field. The basic disciplines in the quantitative and behavioral sciences and an understanding of the specific situational context are integrated. Cases are designed to provide the necessary background in topics specifically relevant to production problems.

45.410 Production Control and Inventory Management (3 q.h.)

Theory and practice of the economic control of inventories are developed. A broad spectrum of models for production control and inventory management is examined. Solutions are sought by analytical methods and by numerical simulation. Goals include bringing the range of concept and techniques to the point of useful application in practical design.

45.411 Industrial Decision Making 1 (3 q.h.)

An application-oriented introduction to prescriptive decision analysis. The course examines the systematic approach to problem solving and decision making, decision theory, structure of human decisions, and modeling of the decision process. *Prereq.* 10.633.

45.412 Industrial Decision Making 2 (3 q.h.)

Application of probability and utility theory, psychology, and economics to the decision process. Topics covered include the perception of options, uncertainties and objectives, decision trees, and other modes of representation. Course also covers criteria of choice, including preference and utility, attitude toward risk, expected value. Practical usefulness of techniques, with application to career planning, job and organization design, and managerial effectiveness. Surveys current practices, using real world cases. *Prereq.* 45.411.

45.413 Manufacturing Seminar 1 (3 q.h.)

Course examines in depth the problems of manufacturing operations at the plant manager level, including analysis of manufacturing issues and controls of the manufacturing process; selected case studies are an important part of the course. *Prereq.* 45.403, 45.410.

45.414 Materials Management (3 q.h.)

Topics include the development and examination of materials management, including objectives, organization, and functions, as they relate to cost improvement, investment control, and ability to serve the market; materials system; selected case studies.

45.416 Manufacturing Seminar 2 (3 q.h.)

A program of independent study on an approved topic in a particular area of Industrial Management, under the supervision of a faculty member. *Prereq.* 45.413.

45.417 Industry and the Environment 1 (3 q.h.)

Features in-depth analyses of situations where economic interests and environmental concerns are in conflict. Reviews the operation of the capitalistic system as a foundation for examining the resultant ecological risks associated with chemicals, strip-mining, and supertankers.

45.418 Industry and the Environment 2 (3 q.h.)

The thoughts of Amory Lovins and E. F. Schumacher serve as the basis for examining the economic benefits associated with energy conservation, alternative energy systems, and solid-waste recovery systems. *Prereq.* 45.417.

45.419 Managing for Results (3 q.h.)

Serves as a forum for the discussion of the wide-ranging theories of Peter Drucker. Emphasis is placed on the concepts and methods available to the results-oriented manager. Topics are derived from selected writings of Drucker. Relations between theory and practice, including implementation, will be established.

45.420 Economic Analysis in Industry (3 q.h.)

Examination of the principles and techniques needed for analysis of the acquisition and retirement of capital goods by industry and government. Development of the assumptions underlying the various measures of anticipated profitability of capital expenditures, their uses and limitations.

45.421 Management and Operational Control Systems (3 q.h.)

Analysis of the nature of control in general and the characteristics of management control and operational control. Study of control structures, processes, and bases for design and implementation.

Purchasing

Associate Consultant: Mr. Gerald E. Maguire (620-0810 X 141)

45.451 Purchasing 1 (3 q.h.)

An introduction to the function of purchasing in the industrial organization. Topics include the span of purchasing responsibilities, objectives, organization, and personnel requirements; purchasing policy and systems; the role of the computer in regulating purchasing planning, transactions, and information retrieval; acquisition of purchased materials, development of sources of supply, and assurance of materials quality; and determination and maintenance of required inventory levels. Additional topics covered are control of inventory investment, price determination, cost and price analysis of purchase transactions; make or buy decisions; and role of standardization and value analysis.

45.452 Purchasing 2 (3 q.h.)

The process of purchase negotiations, budgets, purchase of capital equipment. Topics include purchasing for public and nonprofit institutions; disposition of surplus and obsolete materials; traffic and material handling; forward buying and speculation; ethical considerations in purchasing; purchasing law, contract cancellations, purchasing reports, and evaluation of purchasing performance; and control and audit procedures. *Prereq.* 45.451.

45.453 Purchasing (Intensive) (6 q.h.)

Same as 45.451 and 45.452. (*Not open to students who have taken those courses.*)

45.455 The Materials Acquisition Function (3 q.h.)

A survey of the procurement function as found in industry. Designed to furnish students with a broad comprehension of the acquisition function. The mission, procedures, and interfacing of purchasing with other functions and its legitimate objectives are explored. Systems techniques, organizational structures, and required skills are investigated, with particular attention given to the integration of this function into the total cycle of product creation.

45.457 The Art and Technique of Negotiation in Business (3 q.h.)

The process of buyer/seller communication and exchange in arriving at sound purchasing transactions. Explores the reasons for choosing this negotiation, interactive process for arriving at a more satisfactory agreement between buyer and prospective vendor. Accepted strategies and tactics employed by both parties as effective means of achieving legitimate objectives in industrial purchasing activity. Economic and technical

considerations are discussed. Psychological and interpersonal environments of the negotiating situation are explored in detail. Students have an opportunity to engage in workshop demonstrations of effective negotiating practice. *Prereq.* 45.451.

45.458 Materials Requirements Planning (3 q.h.)

Analyzes the MRP process for integrating and organizing purchasing and inventory management functions. System is based on production schedule requirements and variations rather than on historical data. System aims at assisting the process of capacity planning for maximum manufacturing efficiency. MRP provides a rational base for economical procurement planning and control. Concentrates on MRP's unique concepts for managing material supply activity and other related, critical operating problems.

45.459 Subcontract Management (3 q.h.)

The administration of procurement subcontracts is of major concern to many industrial specialties: purchasing, sales, engineering, project management, finance, manufacturing, and general management. Aims at considering all aspects of this significant procurement function, from development of the work statement through source selection, negotiation, award and post-award administration. Selected cases and exercises will be employed to enhance the students' appreciation of the practical aspects of subcontracting policies and procedures, as well as providing material for class participation. Subcontract requirements in both a commercial as well as a government environment will be treated. *Prereq.* 45.452.

45.460 International Procurement (3 q.h.)

An overview and introduction into international procurement, with emphasis on negotiations of special terms and conditions, offset, coproduction buys. Topics include differences in overseas freight management financial and contractual requirements and discussion of reliability/quality and procurement practices in international procurement. *Prereq.* 45.452.

47: Real Estate

Consultant: Mr. Leo M. Flynn (927-3406)

47.320 Real Estate Fundamentals 1 (3 q.h.)

An introduction to the basic principles and terminology of real estate to serve as a background for application in the various practices of the real estate business.

47.321 Real Estate Fundamentals 2 (3 q.h.)

A general examination of the practices of real estate brokerage (including the preparation for the broker's or salesperson's state exam), real estate appraisal, finance, development, management, and investment. *Prereq.* 47.320.

47.322 Real Estate Fundamentals (Intensive) (6 q.h.)

Same as 47.320 and 47.321. (*Not open to students who have taken those courses.*)

47.323 Real Estate Appraisal 1 (3 q.h.)

A fundamental course in the appraisal of single-family residences; analysis of city or town neighborhood influences, site evaluation, building diagnosis, depreciation; study of the various approaches to value; appraisal report preparation. *Prereq.* 47.321.

47.324 Real Estate Appraisal 2 (3 q.h.)

A specialized course in the appraisal of income properties; application of the cost, market, and income approaches to apartment buildings and other commercial and industrial properties; and application of the various methods of capitalization and residual techniques. *Prereq.* 47.323.

47.328 Real Estate Financial Analysis 1 (3 q.h.)

Provides the tools that permit the student to examine and analyze critically any proposed real estate investment. Examines in detail the financial aspects of acquisition, ownership, and disposition. Considers taxation of investments, forms of property ownership (organization of the venture), analysis of operating statements, financial accounting, use of leverage, "tax-sheltered" investments, special situations, and other considerations. Develops criteria of risk and return on investment (R.O.I.) that should be established by various types of investors. *Prereq.* 47.324 or permission of instructor.

47.329 Real Estate Financial Analysis 2 (3 q.h.)

A detailed analysis of the risks and rewards of real estate investments, problems involved in financing income properties, with emphasis on the use of case studies, homework problems, class discussion and debate. Class participation is stressed. *Prereq.* 47.328.

47.330 Real Estate Development (3 q.h.)

A practical step-by-step approach to the organization and development of a real estate project for the entrepreneur, banker, or broker. Topics include the role of the developer, acquisition of land, site analysis, construction finance, gap financing and permanent commitments, project budgeting for capital costs and for income and expense, selection of professionals, negotiations of agreements with contractors and owners, marketing the completed project. Case studies and guest lecturers may be used. *Prereq.* 47.329 or permission of instructor.

47.331 Real Estate Law 1 (3 q.h.)

Concentrates on private real estate law, including ownership rights in land; leasehold rights and easements in the land of another; legal forms of ownership; the transfer and acquisition of title and of other interests; recording of deeds, leases, and other instruments; and the landlord-tenant relationship.

47.332 Real Estate Law 2 (3 q.h.)

Concentrates on public real estate law, including government powers, rights, and controls on privately owned real estate; zoning and subdivision controls; conservation controls; taxation of real estate; rent controls; and eminent domain.

47.334 Real Estate Management 1 (3 q.h.)

Designed to help the student prepare for the practical problems of real estate management. Stresses the requisite day-to-day management of commercial, industrial, and residential properties, as well as the need for a management strategy as it relates to long-term property values. *Prereq.* 47.321 or permission of instructor.

47.335 Real Estate Management 2 (3 q.h.)

Continuation of 47.334. *Prereq.* 47.334.

47.336 Real Estate Management 3 (3 q.h.)

Continuation of 47.335. *Prereq.* 47.335.

47.337 Real Estate Title Examination (3 q.h.)

A specialized course dealing with the examination of title to real estate and the preparation of a complete report. *Prereq.* 47.321 or permission of instructor.

47.338 Real Estate Financial Analysis (Intensive) (6 q.h.)

Same as 47.328 and 47.329. (*Not open to students who have taken those courses.*)

47.339 Appraising a Single-Family Dwelling (3 q.h.)

A fundamental course in the basic theory of the appraising of a single-family dwelling for the beginning appraiser, real estate broker, salesperson, lender, assessor, and builder. Topics include city and neighborhood analysis, site valuation, building materials and cost, and depreciation. The course deals with selective research into appropriate market data, assemblage of pertinent information, the application of relevant analytical techniques, and appraisal report preparation, including FNMA/FMAC report forms.

47: Hotel and Restaurant Management

Consultant: Mr. Donald A. Witkowski (362-2131 X 361)

47.400 Introduction to Hotel and Restaurant Management (3 q.h.)

A survey of the hospitality industry in today's economy. Emphasis on industry growth and development, management problems, and principles of hotel and restaurant management.

47.405 Management Systems for the Hospitality Industry (3 q.h.)

A study of the information systems utilized in the hospitality industry to provide better management information for analysis and decision making. *Prereq.* 49.311.

47.406 Front Office Management (3 q.h.)

The role and functions of the front office will be studied as they relate to the operation of the entire hotel. The following areas are covered: front office structure, registration, payment, reservations, and night audit.

47.407 Hotel and Restaurant Law (3 q.h.)

An introduction to the fundamental laws, rules, and regulations applicable to the hospitality industry.

47.408 Hospitality Marketing Management (3 q.h.)

An analysis of the market in which the hospitality industry operates. The development and implementation of a marketing plan to meet operational goals. *Prereq.* 43.301.

47.409 Design and Layout (3 q.h.)

A consideration of the design and layout applicable to the hotel and restaurant industry.

47.410 Food Preparation 1 (3 q.h.)

Introduction to the fundamentals of food preparation and service, with emphasis on terminology and equipment of the food service industry. Students receive classroom instructions and participate in demonstrations of preparing food in a small-quantity laboratory. Menu planning, requisitioning, pricing, as well as preparation and service are covered. (Laboratory fee)

47.411 Food Preparation 2 (3 q.h.)

A continuation of 47.410. *Prereq.* 47.410. (Laboratory fee)

47.412 Food Service Engineering and Sanitation (3 q.h.)

Examines the organization of the maintenance and engineering function and provides the technical information necessary to establish effective preventive programs. Also, details the fundamentals of sanitation for food service employees and covers practical guidance in safe food handling.

47.415 Seminar in Hotel and Restaurant Management (3 q.h.)

A broad interdisciplinary project utilizing one or more of the techniques of library research, field research, field survey, and organizational audits. Students will have the opportunity to utilize the knowledge gained in earlier course work.

47.417 Food and Beverage Cost Control (3 q.h.)

Introduces management attitude toward cost controls through analysis of every aspect of the food service operation. Topics include classification of food service facilities, cost accounting, purchasing, inventory, and production control methods.

47.418 Purchasing Methods for Food and Lodging Industry (3 q.h.)

Discusses accepted methods of purchasing food products, such as meat, fish, poultry, fresh fruit, produce, and groceries, and nonperishable items, such as equipment and housekeeping supplies used in the industry. Evaluation of products, yield testing, determining real cost. Use of special testing equipment to help in evaluation will be employed.

47.419 Introduction to Tourism (3 q.h.)

Introduction to the science, art, and business of attracting, transporting, and accommodating visitors and graciously catering to their needs and wants. Topics include: sociology, psychology, marketing, and the economics of tourism.

47.422 Food Science and Technology (3 q.h.)

An introductory course dealing with principles of food processing, quality assurance, and quality control in assessing product stability, produce changes, and consumer acceptance. Designed to provide an understanding of the applications of these principles to food and food service operations. (Replaces 47.413)

47.423 Managerial Accounting for the Hospitality Industry 1 (3 q.h.)

A study of the financial practices and systems used in the hospitality industry. Controls, budgeting, financial statements, and specialized industry accounting procedures are analyzed. *Prereq.* 41.302.

47.424 Managerial Accounting for the Hospitality Industry 2 (3 q.h.)

A continuation of 47.423. *Prereq.* 47.423.

48: Transportation and Physical Distribution Management

Consultant: Dr. James F. Molloy (College of Business Administration) (437-4812)

48.301 Elements of Transportation (3 q.h.)

An introduction to regulatory, economic, and management aspects of transportation from the viewpoint of shippers, government, and carrier management. Topics include: cost, rates, operations, entry, mergers, and intercity passenger carriage. This is a course of general interest to students in business, law, or government.

48.302 Physical Distribution Management (3 q.h.)

An introduction to the physical distribution management concept. Topics include inventory control, warehousing, cost control, and locational strategy. Course uses text and case materials developed from industry situations.

48.303 Organization and Control of Physical Distribution Management (3 q.h.)

Course reviews the establishment of the firm's physical distribution organization, interrelation with other company functions, and examines advanced physical distribution problems.

48.304 Management of Warehouse Operations (3 q.h.)

A practical course in the management of warehouses. Topics include: site selection, construction, finance, operations, measurement of performance, and warehouse technology.

48.305 Traffic Management 1—Rates and Tariffs (3 q.h.)

A practical course in the interpretation and use of tariffs. Topics include classifications, rate scales, tariff rules, rate-making procedures, and ICC law and practice.

48.306 Traffic Management 2—Selected Topics (3 q.h.)

Further study of traffic management, covering such topics as routing, claims, insurance, consolidation, and packaging. *Prereq.* 48.305.

48.307 Contemporary Issues in Transportation and Distribution (3 q.h.)

Focuses attention on a limited number of topics that are of particular interest during the current academic year.

48.310 Surface Transportation 1—Railroad Management (3 q.h.)

A management-oriented course that considers the current and future status of the railroads. Topics include: investment and finance, mergers, marketing, labor relations, diversification, and public policy.

48.311 Surface Transportation 2—Motor Carrier Management (3 q.h.)

A management-oriented course that examines the regulated motor carrier industry. Topics include: equipment selection, finance, government promotion and regulation, technological innovations, port facilities, and labor relations.

48.312 Surface Transportation 3—Marine Transportation (3 q.h.)

A management-oriented course that examines the U.S. Merchant Marine. Topics include: international trade patterns, government promotion and regulation, technological innovations, port facilities, and labor relations.

48.313 Surface Transportation 4—Private Trucking (3 q.h.)

A management-oriented course that examines the formation of a private trucking operation. Topics include: legal guidelines, purchase vs. lease, operations, and performance measurement.

48.314 Air Transportation (3 q.h.)

Economics and regulation of air carriage certified by the Civil Aeronautics Board. Topics include: entry, operations, pricing, mergers, cost analysis, and financing.

48.315 Urban Transportation (3 q.h.)

The scope and status of transportation in our metropolitan area. Examines the planning and financing of urban transportation systems; the role of local, state, and federal government units; and the problems of transit management.

48.316 Carrier Management (3 q.h.)

Examines the transportation system from the carrier viewpoint. Topics include: managerial response to a heavily regulated and rapidly expanding environment; carrier decision making involving routes, scheduling, financing, and pricing of services.

48.320 Transportation Loss, Damage, and Other Claims (3 q.h.)

Comprehensive review and examination of the rules, regulations, and pertinent elements of transportation claims resulting from the loss or damage of cargo, overcharges and undercharges, and related carrier and shipper activities.

48.321 Transportation Regulation 1 (3 q.h.)

Examines principal elements of transport regulation, public policy, and the role of federal and state regulatory agencies. Specific attention is given to the types of

commerce, carriers, and service subject to regulation, entry and exit requirements, economic and cost considerations, and selective rate and tariff construction rules. Addresses all modes, with stronger emphasis on rail and motor issues.

48.322 Transportation Regulation 2 (3 q.h.)

Examines the regulations and industry practices, covering the performance requirements, liabilities, and responsibilities of shippers, regulated carriers, and exempt forms of transportation. Reviews rules and procedures established by the ICC and Massachusetts DPU, with specific attention directed toward informal and modified procedure cases. *Prereq.* 48.321.

48.323 International Transportation and Distribution Management (3 q.h.)

Review of United States role in international transportation. Emphasis is placed on the industry structure of two primary modes of international transportation—aviation and maritime. Also examines the major indirect supporting businesses and/or agencies involved in the international movement of people and goods.

48.324 Case Studies in Transportation Regulation 1 (3 q.h.)

An intensive study course directed toward review and understanding of pertinent areas of transportation regulation and economics. Involves preparation of selected cases dealing with many areas of traffic law to develop understanding of the Interstate Commerce Act and related statutes.

48.325 Case Studies in Transportation Regulation 2 (3 q.h.)

Continuation of 48.324. *Prereq.* 48.324.

48.326 Case Studies in Transportation Regulation 3 (3 q.h.)

Continuation of 48.325. *Prereq.* 48.325.

49: Law

Consultant: Thomas J. Ahern, Esq. (426-4211)

49.301 Law 1 (3 q.h.)

An introduction to the legal system. Topics include study of the nature, formation, and essential elements of contracts, including performance and remedies for breach. Course also examines agency law, including rights and duties of principal and agent, scope of authority, and relationships to third persons.

49.302 Law 2 (3 q.h.)

Course examines sales as governed by the Uniform Commercial Code, including the law of warranty, business organizations, partnerships, corporations, and other important business forms. *Prereq.* 49.301

49.303 Law (Intensive) (6 q.h.)

Introduction to the legal system. Agency: rights and duties of principal and agent, scope of authority, relationships to third persons. Contracts: nature, formation, and essential elements of contracts. Sales: as governed

by the Uniform Commercial Code, including law of warranty. Business organizations: partnerships, corporations, and other important business forms.

49.304 Law and Social Issues (3 q.h.)

A study of the structure and dynamics of the American legal system, approached through an analysis of selected cases dealing with social issues.

49.305 Law 3 (3 q.h.)

Topics include commercial paper: a study of the function of negotiability; emphasis on bank checks and promissory notes; property: real property, personal property, and bailments; bankruptcy and secured transactions. *Prereq.* 49.302.

49.306 Law for Personal Planning (3 q.h.)

Legal aspects of personal and family planning, including: consumer rights, wills and estate planning, marital law, real estate purchase, tenants' rights, and other selected topics of interest.

Management Information Systems

Consultant: Mr. Thomas J. McNamara (895-6047)

Associate Consultant (EDP): Mr. Thomas W. Kelly (726-2273)

Associate Consultant (Programming): Mr. Jeremiah Sullivan (443-3122)

Associate Consultant (Systems): Mr. Norman J. Conklin (671-7502)

Coordinator (Programming): Mr. Bennett Kramer (588-9100 ext. 208)

Coordinator (Programming): Mr. Andrew Efsthathiou (727-6254)

49.310 Introduction to Data Processing and Information Systems 1* (formerly Electronic Data Processing 1) (3 q.h.)

An introduction to computers, including discussion of numbering and coding systems, data processing history, business and computer concepts, hardware, and input and output devices.

49.311 Introduction to Data Processing and Information Systems 2* (formerly Electronic Data Processing 2) (3 q.h.)

A continuation of 49.310, including a discussion of the systems development life cycle; programming tools and preparation; overview of programming languages concepts; use of computers and specific business applications, data communication concepts, time sharing, data base principles. *Prereq.* 49.310.

49.314 Introduction to Data Processing and Information Systems (Intensive) (6 q.h.)

Intensifies material of 49.310 and 49.311 into a single quarter by doubling frequency of class meetings and pace of nonclass work.

49.320 Introduction to Programming in COBOL* (formerly COBOL for Non-Programmers) (3 q.h.)

A one-quarter introductory computer programming course for business students. Fundamentals of computer programming are introduced along with COBOL (Common Business Oriented Language). The divisions of COBOL, data file structures, and verb actions are studied. Each student will prepare and check out several programs using the University Computer Center. *Prereq.* 49.311.

49.321 COBOL Programming 1 (3 q.h.)

Fundamentals in computer programming for business applications are introduced. COBOL (Common Business Oriented Language), the standard business programming language of EDP, is studied. Principles of flowcharting, as well as input and output formats, are studied. Programs prepared by the student are run and checked out. *Prereq.* 49.311.

49.322 COBOL Programming 2 (3 q.h.)

Programming in COBOL is presented in more detail. Business data processing functions of input editing, record processing, and output editing are illustrated and implemented in programs prepared and run on the University's computer. Students may use on-line terminals for program checkout. *Prereq.* 49.321.

49.323 COBOL Programming 3 (3 q.h.)

More sophisticated computer programming techniques are applied to the solution of more complex business application problems. Different techniques and approaches are discussed, e.g., top-down design will be discussed and structured programming techniques will be practiced. Meetings are divided into lectures and computer problem-solving sessions. File processing problems in magnetic disk and magnetic tape are presented. COBOL subroutines and sort techniques are studied. *Prereq.* 49.322.

49.339 COBOL Programming (Intensive) (9 q.h.)

An introduction to COBOL computer programming, intensified into one quarter. Covers the material in COBOL Programming 1, 2, and 3 (see 49.321, 49.322, and 49.323). Class meets two nights a week for three hours each night. *Prereq.* 49.311 or 49.314.

49.341 Advanced COBOL Programming (3 q.h.)

This one-quarter programming course is offered for the advanced COBOL programmer. Several kinds of programming disciplines will be presented. Programming techniques studied will include string and unstring, call subroutines, table handling with 1, 2, and 3 dimensions, indexed sequential access methods (SAM) for file processing, debug, communications, and copy library. *Prereq.* 49.323.

49.344 COBOL Programming (Intensive) A (6 q.h.)

Intensifies material of 49.321 and 49.322 (COBOL Programming 1 and 2) into a single quarter by meeting twice a week for two hours per session. The pace of computer programs written and debugged is also intensified. *Prereq.* 49.311.

49.345 COBOL Programming (Intensive) B (6 q.h.)

Intensifies material of 49.323 and 49.341 (COBOL Programming 3 and Advanced COBOL Programming) into a single quarter by meeting twice a week for two hours per session. The pace of computer programs written and debugged is also intensified. *Prereq.* 49.322 or 49.344.

49.324 Assembly Programming 1 (3 q.h.)

Introduction to assembler language programming, using the University's computing system. Organization, representation, and processing data within the computer. Looping, instruction modification, indexing, indirect addressing, and data retrieval are introduced. cursory survey of assembler languages in general. *Prereq.* Demonstrated familiarity with any currently available computer language.

49.325 Assembly Programming 2 (3 q.h.)

Further exploration of assembler language techniques, other addressing structures, floating point techniques, coding, and use of macro instructions. Input-output routines, use of operating systems for job scheduling resource allocation, file handling. Business problems analyzed, flowcharted, programmed, and debugged on the University's computer by students. Debugging of problems by core dump analysis. *Prereq.* 49.324.

49.326 Assembly Programming 3 (3 q.h.)

Utilization of business data processing hardware on the University's computing system. Further use of operating system, divide independent file handling. Blocked and unblocked file manipulation. Application of assembler language to a sophisticated programming project. *Prereq.* 49.325.

49.327 FORTRAN Programming 1 (3 q.h.)

Designed to give the student the opportunity to gain a working knowledge of FORTRAN, the modern problem-oriented computer language. Enables the professional to understand the use of a computer in solving problems in business, mathematics, and the social and physical sciences through an introduction to problems in selected applications and use of FORTRAN in finding solutions. *Prereq.* 49.311.

49.328 FORTRAN Programming 2 (3 q.h.)

Helps provide the student with practical experience in the use of FORTRAN in solving significant problems in business, mathematics, and the social and physical sciences. Problems of sufficient complexity are used to allow the student to actively participate in the various steps necessary to analyze, define, document, and solve the problem using FORTRAN. *Prereq.* 49.327.

49.329 FORTRAN Programming 3 (3 q.h.)

A sophisticated set of problems is presented to teams of students for solution. Consultations with instructor allow students to participate actively in solving problems with the use of FORTRAN. *Prereq.* 49.328.

49.347 FORTRAN Programming (Intensive) (9 q.h.)

Intensifies material of 49.327, 49.328, 49.329 into a single quarter by meeting twice a week for three hours per session. The pace of nonclass work is also intensified. *Prereq.* 49.311.

49.330 RPG Programming (3 q.h.)

Course presents a working knowledge of the Report Program Generation language. This language is suited to small-scale computer usage for such tasks as report generations, file updating, various utility functions. Students write and debug class problems using a computer available to the student. *Prereq.* 49.311 or 49.314.

49.331 Computer Operating Systems 1 (3 q.h.)

Survey-type course describing operating systems and investigating the full range of systems services available under computer operating systems. Special emphasis is placed on their value as tools for developing management information. *Prereq.* 49.323.

49.332 Computer Operating Systems 2 (3 q.h.)

Specific software systems covered are systems supervisor, data management system, FORTRAN, COBOL, PL/1, and special-purpose compilers. Also investigated are operating systems that accommodate network analysis, PERT systems, simulation packages, and statistical analysis packages. Detailed analysis on data management systems with specific case studies and development of operating system programs. *Prereq.* 49.331.

49.333 Mini-Computers in Business 1 (3 q.h.)

Applicable to non-MIS business majors, as well as students with a Systems or EDP focus. Topics covered include: analysis of cost/performance; systems consideration of minis vs. alternatives; role of minis in a variety of applications, such as time sharing, intelligent terminals, data entry and gathering, data communications. Emphasis is placed on evaluation of minis as cost-effective elements of a business system. *Prereq.* 49.320 or 49.321.

49.334 Mini-Computers in Business 2 (3 q.h.)

Development of system specifications, functional configurations, systems tradeoffs, site preparation, and maintenance considerations. Detailed analysis of systems with specific case studies related to business applications. *Prereq.* 49.333.

49.335 Introduction to Programming in BASIC (3 q.h.)

A stand-alone, one-quarter introduction to computer programming using BASIC (Beginners All-purpose Symbolic Instruction Code). BASIC is the computer programming language used to a great extent in mini-computers or personal computers. It is the computer language used in small businesses, or it can be studied as a hobby. Students will write and execute a number of problems using the terminals attached to the University Computer Center. *Prereq.* 49.311.

49.336 Data-Base Systems (3 q.h.)

An introduction to data-base approach to the design of integrated information applications. Data-base design, data structures, diagramming, CODASYL data definition language, data manipulation language, data-base implementation and evaluation. *Prereq.* 49.322, 49.361.

49.340 Programming in BASIC 1 (3 q.h.)

An introductory-level course in computer programming using the language BASIC (Beginners All-purpose Symbolic Instruction Code), an easily learned, comprehensive language which will allow students to begin using EDP methods in problem solving. Students will write, debug, and execute a number of individual and class projects using the University Computer Center. BASIC is a programming language that lends itself well to execution from off-site terminal hardware. *Prereq.* 49.311.

49.342 Programming in BASIC 2 (3 q.h.)

A continuation of 49.340, covering more sophisticated computer programming. Techniques are applied to the solution of more complex application problems. BASIC subroutines are studied and file processing problems are presented. Meetings are divided into lectures and problem-solving sessions. *Prereq.* 49.340.

49.343 PASCAL Programming 1 (3 q.h.)

An introductory course in computer programming using the language PASCAL, which is particularly popular in the educational and microprocessor communities. Students will write, debug, and execute a number of individual and class projects using the University Computer Center. *Prereq.* 49.311.

49.346 PASCAL Programming 2 (3 q.h.)

A continuation of 49.343, covering more sophisticated computer programming. Techniques are applied to the solution of more complex problems. *Prereq.* 49.343.

49.360 Systems Analysis and Design 1 (3 q.h.)

An introductory course to Systems Analysis and Design. A study of systems organizational structures as they relate to MIS functions within a business enterprise. Includes study of systems project initiation, preliminary and detailed systems investigations, and analysis techniques. In addition, it covers the start of the system output design process. *Prereq.* 49.311.

49.361 Systems Analysis and Design 2 (3 q.h.)

This quarter builds upon what was studied in 49.360. Includes a continuation of the systems output design, systems input design, and the design of systems files; the design considerations related to computer systems processing and the importance of systems controls in on-line and off-line batch systems; study of systems design proposals to management. *Prereq.* 49.360.

49.362 Systems Analysis and Design 3 (3 q.h.)

This quarter covers systems development implementation and evaluation phases of a total MIS system.

Covers an introduction to project management, project scheduling, training, and documentation; programming assignments, specifications, testing and conversion techniques. Discusses the pros and cons of differing hardware and software alternatives related to systems implementations and helps the student make a reasonable choice in each case. Includes a discussion of current and future trends in systems analysis and design. *Prereq.* 49.361.

49.363 Systems Analysis and Design 4 (3 q.h.)

This quarter covers data communications and distributed processing techniques as related to Management Information Systems. Includes the study of communication concepts, hardware, software, and network topologies from the business system perspective. Also includes data flow analysis, network concepts, and control techniques. A team case study will solidify communication fundamentals. *Prereq.* 49.362.

49.375 Systems Analysis and Design 1 (Intensive) (6 q.h.)

Same as 49.360 and 49.361. (*Not open to students who have taken those courses.*)

49.379 Systems Analysis and Design 2 (Intensive) (6 q.h.)

Same as 49.362 and 49.363. (*Not open to students who have taken those courses.*) *Prereq.* 49.361.

49.364 Data Systems Administration (3 q.h.)

The major phases involved in the study and detailed planning for effective use of data processing equipment and management sciences in meeting the information needs of business, including the analysis of company objectives, feasibility study, system specifications, equipment selection, and implementation of the new system. *Prereq.* 49.311 or 49.314.

49.365 Business Data Processing Applications 1 (3 q.h.)

Each student is given an opportunity to understand and perceive a company as a total operating system. Specific systems applications examined include inventory control, purchasing, accounts payable, and their integration. Specific techniques on data collection, including data communications, are dealt with during the quarter. A field trip to a communications training center and a team case study project complete the quarter. *Prereq.* 49.364.

49.366 Business Data Processing Applications 2 (3 q.h.)

A continuation of 49.365, covering additional information systems of accounts receivable, sales analysis, the design of integrated systems, a review of on-line systems, and computer system simulation. The opportunity to participate in a computer simulation exercise is offered during a field trip. A team case study project completes the quarter. *Prereq.* 49.365.

49.367 Senior Seminar 1 (3 q.h.)

The student pursues a project on an approved topic tailored to meet individual needs in a particular area of MIS/EDP, under the supervision of a faculty member.

49.368 Senior Seminar 2 (3 q.h.)

A continuation of Senior Seminar 1. *Prereq.* 49.367.

49.369 Auditing Data Processing (3 q.h.)

Develops and discusses audit techniques, specifically toward EDP systems, programming, and operations. Emphasis on EDP standard practices, procedures, documentation, and safety and security. Defines EDP business risks and related exposures, e.g., fraud, embezzlement, misuse or destruction of company assets, or business interruption. Discusses EDP portion of accounting requirements of the Foreign Corrupt Practices Act of 1977. Course content is oriented toward EDP managers, internal auditors, and public accountants. Useful to the auditor, because it defines EDP-specific audit techniques and is correspondingly useful to the EDP manager regarding what to expect when receiving a comprehensive audit. *Prereq.* 49.311.

49.373 Information Processing in Medicine (3 q.h.)

A nontechnical survey of the impact and potential of computers in medicine: medical records, clinical reporting systems, automated laboratories, on-line monitoring, research needs, medical administration requirements. Analysis of the content and interactions of medical information subsystems. Implications of computerization of various medical activities, equipment selection, organizational considerations. *Prereq.* 49.310 or 49.314.

49.376 Computer Privacy and Security (3 q.h.)

A comprehensive review of the real threats posed by modern electronic computers, as well as threats to computers and their users. Includes a review of the privacy issue as well as security approaches, techniques, and tools used to safeguard computers. Uses actual case studies of computer abuse. *Prereq.* 49.311.

49.390 Structured Analysis and Design Methods (3 q.h.)

Examines and illustrates the methods of structured systems analysis and design. Topics include top-down design, data-flows, decision logic documentations, structured English, structured walk-throughs, and the use of the data dictionary as a documentation tool. Students learn by applying the methods to sample business problems and case studies. *Prereq.* 49.362.

Quality Control and Management Sciences

Associate Consultant: Mr. Cephas Rogers (684-5238)

49.380 Introduction to Operations Research (3 q.h.)

Course covers mathematical programming; linear programming; graphical, simplex, and transportation models; sensitivity analysis; the dual, degeneracy, integer programming; and nonlinear programming.

49.381 Operations Research Applications (3 q.h.)

Special topics including decision making under uncertainty; decision-tree analysis; dynamic programming; queuing theory, PERT-CPM, and simulation. *Prereq.* 49.380.

49.382 Statistical Quality Control (3 q.h.)

Description and practical application of the basic statistical quality control methods for quality assurance, quality control, and quality improvement of products and services; the determination of process capability; the use of quality control charts for measurable and nonmeasurable quality characteristics; application of statistical and probability considerations in acceptance sampling of purchased material, work in process, and outgoing products; methods of predicting sampling results using the hypergeometric, the binomial, and the Poisson distributions; risks involved in sampling and concepts of AQL, RQL, and AOQL. *Prereq.* 39.313.

49.383 Management of Quality Control (3 q.h.)

Modern concepts of managing the quality control function of a company to maximize customer satisfaction at minimum quality cost; the idea of total quality control; measurement of the cost of quality, development of a coordinate program of improvement, organizing for diagnosis of defect causes. *Prereq.* 49.382.

49.384 Advanced Quality Control (3 q.h.)

Detailed study of specialized techniques used in defect-cause diagnosis and problem analysis. Complete analysis of process capability, the multi-vari chart, pictograms, the span plan method, special emphasis on design of control plans for process quality control and special cases of product acceptance. *Prereq.* 49.383.

49.385 Principles of Material Inspection (3 q.h.)

An operating and technical-level course involving mensuration, need, and function of inspection and specifications; basic principles and techniques of measurements; various methods and equipment used for gauging and measuring; special measuring and inspection problems.

49.386 Industrial Experimentation (3 q.h.)

Modern small-sample techniques are applied to industrial problems. Use of statistical inference to make estimates and set confidence intervals of key characteristics of production lots and processes; design of single- and multiple-factor experiments; tests of significance; analysis of variance. Correlation techniques; experimental design, balancing and randomizing techniques; factorial designs; nested designs; Latin square; random balance/multiple balance. *Prereq.* 39.313.

49.388 Principles of Quality Assurance (3 q.h.)

The quality assurance function is an ongoing responsibility beginning with product design and continuing with vendor selection, incoming inspection, stock room control, monitoring of the manufacturing process, final product inspection, and the crucial final phase of cus-

sumer acceptance. Examines the process described above and the role of quality assurance as the product moves through the stages from product design to consumer acceptance. *Prereq.* 39.313.

Human Resources Management

Consultant: Prof. Christine L. Hobart (College of Business Administration) (437-4728)

Associate Consultant: Mr. Ronald E. Guittarr (475-8382)

Associate Consultant: Mr. Daniel F. Hurley (785-0484)

49.404 Personnel Management 1 (3 q.h.)

Course examines organization, function, and procedures of the personnel department in relation to the management organization; manpower selection; training; rating; personnel policies, benefits, and reports.

49.405 Personnel Management 2 (3 q.h.)

Covers principles and techniques of training, the psychology of learning, meeting training needs, principles and practices of organizing training activities. *Prereq.* 49.404.

49.406 Personnel Management 3 (3 q.h.)

Course deals with the control and coordination of the managerial responsibility of supervision, including planning the work, employee assignments, employee attitudes, employee grievances, administering company policies, developing work interest. *Prereq.* 49.405.

49.407 Techniques of Employee Selection (3 q.h.)

Course covers recruitment, selection, and placement techniques, including interviewing, employment testing, and examining.

49.408 Wage and Salary Administration (3 q.h.)

Course covers wage and salary determination, including merit and incentive plans, wage and salary structure, compensation methods, and impact on employer-employee relations in the economy.

49.409 Employee Benefits (3 q.h.)

Private and public programs directed to job and worker income security are examined, as well as unemployment compensation, training and employment services, private guaranteed income, retirement pension plans and disability, and group insurance.

49.410 Job Evaluation (3 q.h.)

Examines wage-payment systems; reviews theory of wage determination, job elements, rating scales, writing job descriptions and specifications; selection of plans; development of wage structures and integration with the principles of merit rating.

49.411 Creative Problem Solving (3 q.h.)

New ways of thinking are learned and practiced. Sensing and analyzing problems, producing ideas, evaluating and implementing solutions. The attitudes and climates conducive to creative thinking as well as common barriers are presented. Provides methods for developing imagination, which is the key part of the creative process.

49.415 Personnel Management (Intensive) (9 q.h.)

Same as 49.404, 49.405, 49.406.

49.428 Workshop in Labor Management Relations (3 q.h.)

Study of the special skills and knowledge in the negotiation and use of mediation and/or fact finding in the collective bargaining agreement field and in interpreting and applying such agreements and the use of arbitration. Student participation in simulated negotiations and grievance processing. *Prereq.* 49.442.

49.429 Public Sector Collective Bargaining in the United States (3 q.h.)

Seminar format includes examination of the recent growing activities of employee unions in national, state, and local governments; weighing the public interest, impact on services, and the study of administration of personnel and labor relations in these localities. *Prereq.* 49.442.

49.430 Private Sector Collective Bargaining in the United States (3 q.h.)

Seminar topics include critical issues and problems affecting unionized employees, their organizations, employers, and the public in the private domestic sector of our economy. Research and preparation of position paper by the student; class discussion. *Prereq.* 49.442.

49.431 International Labor Relations (3 q.h.)

Seminar comparing and contrasting selected international labor relations systems with that of the United States, examining recent developments such as worker participation and codetermination. Research and preparation of position paper by the student; class discussion. *Prereq.* 49.442.

49.432 Employment Rights 1—Wage and Hour Law (3 q.h.)

A thorough examination of minimum wage, hours of work, overtime, child labor laws, Fair Labor Standards Act, Davis-Bacon Act, Walsh-Healy Act, rules and regulations pertaining to the same and related areas. *Prereq.* 49.442.

49.433 Employment Rights 2—Health, Safety, Disability and Workers Compensation Law (3 q.h.)

An in-depth examination of laws dealing with health, safety, disability, and compensation for work-related injuries, Occupational Safety & Health Act, ERISA, Social Security, Unemployment Compensation, Workers Compensation, Federal Employees Liability Act, Jones Act, Longshoremen & Harbor Workers Compensation Act, and other related laws. *Prereq.* 49.432.

49.434 Employment Rights 3—Fair Employment Law (3 q.h.)

A comprehensive examination of the old Civil Rights Laws (Sections 1981, 1983, 1985 (3), 1988), Title VI, Title VII, Title IX of the Civil Rights Act of 1964, Age Discrimination in Employment Act, Equal Pay Act, Sections 503, 504 of Rehabilitation Act of 1973, E.O. 11246,

Affirmative Action and related areas, and current rulings and court decisions in this area regarding race, sex, religion, national origin, color, age, and disability discrimination. *Prereq.* 49.433.

49.440 Organizational Behavior (3 q.h.)

This course is a fundamental presentation of organizational life. Emphasis is placed on structure and discipline of groups typically in a business setting. Presents issues and data related to leadership styles, employee motivation, and organizational dynamics. The course requires significant student participation.

49.441 Introduction to Human Resources Management (3 q.h.)

Introduces the student to the rights and responsibilities of employer organizations, individual employees, and employee organizations. Understanding of these leads to the functioning and structuring of personnel and labor relations activities within any organization. *Prereq.* 49.440.

49.442 Applied Human Resources Management (3 q.h.)

Examines and evaluates various forms of goals and structure of employer and employee organizations in attaining human resource management effectiveness. In particular, examines the process of collective bargaining as it changes in anticipation of future labor-management conditions. *Prereq.* 49.441.

49.443 Organizational Behavior and Introduction to Human Resources Management (Intensive) (6 q.h.)

Same as 49.440 and 49.441.

Business Administration Intensive Courses

41.304 Accounting Principles (Intensive) (6 q.h.)

Same as Accounting Principles 1 and 2.

41.404 Intermediate Accounting (Intensive) (6 q.h.)

Same as Intermediate Accounting 1 and 2. *Prereq.* 41.302.

41.414 Auditing (Intensive) (6 q.h.)

Same as Auditing 1 and 2. *Prereq.* 41.403.

41.421 Cost Accounting (Intensive) (6 q.h.)

Same as 41.405 and 41.406. *Prereq.* 41.302.

43.303 Introduction to Marketing (Intensive) (6 q.h.)

One-quarter course covering the same material found in Introduction to Marketing 1 and 2, 43.301 and 43.302.

43.330 Advertising and Sales Promotion (Intensive) (6 q.h.)

One-quarter course covering the same material found in Advertising and Sales Promotion 1 and 2, 43.310 and 43.311. *Prereq.* 43.302.

43.331 Sales Management (Intensive) (6 q.h.)

One-quarter course covering the same material found in Sales Management 1 and 2, 43.322 and 43.323. *Prereq.* 43.302.

43.332 Retail Management (Intensive) (6 q.h.)

One-quarter course covering the same material found in Retail Management 1 and 2, 43.319 and 43.320. *Prereq.* 43.302.

43.336 Marketing Management (Intensive) (6 q.h.)

One-quarter course covering the same material found in Marketing Management 1 and 2, 43.334 and 43.335. *Prereq.* 43.302.

43.340 Professional Selling Skills (Intensive) (6 q.h.)

Development of the skills necessary for effective selling. Examines customer buying process and the steps in a company's sales process. Prospecting, preparation, presentation, and postsale activities are discussed. Advanced selling techniques such as team selling are also introduced. Focuses on situations where personal selling is a major element of marketing strategy, such as in industrial product, professional service, and high-technology marketing. *Prereq.* 43.302.

44.327 Personal Financial Management (Intensive) (6 q.h.)

A one-quarter course covering the same material found in Personal Financial Management 1 and 2, 44.325 and 44.326. *Prereq.* 44.301.

44.331 Financial Management (Intensive) (6 q.h.)

A one-quarter course covering the same material found in Financial Management 1 and 2, 44.310 and 44.311. *Prereq.* 44.301.

44.332 Investments (Intensive) (6 q.h.)

A one-quarter course covering the same material found in 44.312 and 44.313. *Prereq.* 44.311.

45.305 Introduction to Business and Management (Intensive) (6 q.h.)

A one-quarter course covering the same material found in 45.301 and 45.302.

45.312 Business Policy (Intensive) (6 q.h.)

Please refer to the course descriptions for 45.310 and 45.311. The content of the intensive course is the same, except it is presented twice per week during a single quarter. *Prereq.* 100 q.h.

45.325 Entrepreneurship and Small Business Management (Intensive) (6 q.h.)

Same as 45.323 and 45.324.

45.402 Production Management (Intensive) (6 q.h.)

Same as 45.400 and 45.401.

45.453 Purchasing (Intensive) (6 q.h.)

Same as 45.451 and 45.452.

47.322 Real Estate Fundamentals (Intensive) (6 q.h.)

Same as 47.320 and 47.321.

47.338 Real Estate Financial Analysis (Intensive) (6 q.h.)

Same as 47.328 and 47.329.

49.303 Law (Intensive) (6 q.h.)

Introduction to the legal system. Agency: rights and duties of principal and agent, scope of authority, relationships to third persons. Contracts: nature, formation, and essential elements of contracts. Sales: as governed by the Uniform Commercial Code, including law of warranty. Business organizations: partnerships, corporations, and other important business forms.

49.314 Introduction to Data Processing and Information Systems (Intensive) (6 q.h.)

Intensifies material of 49.310 and 49.311 into a single quarter by doubling frequency of class meetings and pace of nonclass work.

49.339 COBOL Programming (Intensive) (9 q.h.)

An introduction to COBOL computer programming, intensified into one quarter. Covers the material in COBOL Programming 1, 2, and 3 (see 49.321, 49.322, and 49.323). Class meets two nights a week for three hours each night. *Prereq.* 49.311 or 49.314.

49.344 COBOL Programming (Intensive) A (6 q.h.)

Intensifies material of 49.321 and 49.322 (COBOL Programming 1 and 2) into a single quarter by meeting twice a week for two hours per session. The pace of computer programs written and debugged is also intensified. *Prereq.* 49.311.

49.345 COBOL Programming (Intensive) B (6 q.h.)

Intensifies material of 49.323 and 49.341 (COBOL Programming 3 and Advanced COBOL Programming) into a single quarter by meeting twice a week for two hours per session. The pace of computer programs written and debugged is also intensified. *Prereq.* 39.322 or 49.344.

49.347 FORTRAN Programming (Intensive) (9 q.h.)

Intensifies material of 49.327, 49.328, 49.329 into a single quarter by meeting twice a week for three hours per session. The pace of nonclass work is also intensified. *Prereq.* 49.311.

49.375 Systems Analysis and Design 1 (Intensive) (6 q.h.)

Same as 49.360 and 49.361. *Prereq.* 49.311.

49.379 Systems Analysis and Design 2 (Intensive) (6 q.h.)

Same as 49.362 and 49.363. *Prereq.* 49.361.

49.415 Personnel Management (Intensive) (9 q.h.)

A one-quarter course covering the same material found in Personnel Management 1, 2, and 3, 49.404, 49.405, and 49.406.

49.443 Organizational Behavior and Introduction to Human Resources Management (Intensive) (6 q.h.)

Same as 49.440 and 49.441.

62: Boston-Bouvé**62.410 Cardiovascular Health and Exercise** (1 cl., 3 lab, 3 q.h.)

A comprehensive cardiovascular medical and physical fitness evaluation, including a resting 12-lead electrocardiogram, an exercise electrocardiogram, resting and exercise blood pressure, an aerobic work capacity evaluation, a pulmonary function test, blood lipid profile, cardiovascular medical examination, coronary risk factor profile and medical history, test of body composition, and tests of muscular strength, endurance, and flexibility. Individual exercise programs will be prescribed based on test results and included in a structured exercise and jogging or swimming class three days per week. A weekly cardiovascular health and exercise lecture will be conducted.

63: Therapeutic Recreation Services**63.301 Principles and Practices of Therapeutic Recreation 1** (3 q.h.)

Overview of the field, including rationale, history, philosophy, goals, treatment settings, problems of institutionalization, sexual role demands, loss of human dignity, adjunctive therapies, and professional development in therapeutic recreation. Course will conclude with introduction of case method. *Prereq.* 30.304 or 30.305 or taken concurrently.

63.302 Principles and Practices of Therapeutic Recreation 2 (3 q.h.)

Basic medical terminology and in-depth orientation to sensory, neurological, orthopedic, and cardiovascular disabilities, prosthetics, and orthotics. A study of attitudinal and societal barriers to the handicapped. *Prereq.* 63.301 or permission of consultant.

63.303 Principles and Practices of Therapeutic Recreation 3 (3 q.h.)

Integrated case method approach to understanding the diversified needs of the person who is handicapped. Psychological, sociological, and emotional impact of disabilities. Designing of individual and group activity. Planning, charting, adapting, and evaluating programs. *Prereq.* 63.302 or equiv.

63.304 Group Dynamics and Leadership 1 (3 q.h.)

Self-awareness, identity, interpersonal and intergroup communications. The group process factors influencing the need to join the group, motivation to participate, membership screening, size, purpose, behavior patterns, developing rapport, open-ended and closed approaches, group problem solving, brainstorming, conflict resolution.

63.305 Group Dynamics and Leadership 2 (3 q.h.)

Organization, development, and structure of groups, team building, role and value clarification, ramifications of change, characteristics and styles of leadership. *Prereq.* 63.304 or equiv.

63.306 Group Dynamics and Leadership (Intensive) (6 q.h.)

Equivalent to 63.304 and 63.305.

63.310 Field Practicum 1 (4 q.h.)

Assigned field experience in a treatment facility under supervision of a qualified professional. Student has the opportunity to learn about the direct service application of classroom theory through observation and participation, in conjunction with written reports, evaluation, and seminars. The experience averages eight hours a week for 12 weeks. *Prereq.* 63.303 *plus* 12 q.h. of professional courses and permission of practicum coordinator.

63.311 Field Practicum 2 (4 q.h.)

Continuation of 63.310. *Prereq.* 63.310.

63.315 Independent Study (4 q.h.)

Empirical research project geared to the individual's area of professional focus. The student is expected to gather, analyze, and evaluate original data and periodically submit progress reports to research adviser. *Prereq.* 63.303, *plus* permission of consultant.

63.316 Independent Study (4 q.h.)

Continuation of 63.315. *Prereq.* 63.315 or equiv.

63.321 Social Recreation (3 q.h.)

Planning and motivation for social recreation activities; ice breakers, mixers, active and inactive games, adapting and creating joint projects, special events.

63.322 Music Therapy (3 q.h.)

An introduction to the field of music therapy, including an exploration of the historical and current theories and various contemporary techniques and their uses in various clinical settings. Includes a survey of the literature of therapy, with special education, psychiatric, and geriatric areas.

63.323 Arts and Crafts 1 (3 q.h.)

Overview of the creative media available for individual projects. Development of the technical capability to utilize a wide variety of materials in imaginative ways. Compilation of personal arts and crafts manual as reference tool.

63.324 Arts and Crafts 2 (3 q.h.)

Adaptation of creative skills to a therapeutic setting. Developing flexibility and sensitivity to the client's personal needs and interests so that innovative craft projects are designed to meet needs and to maximize their therapeutic benefits.

63.325 Arts and Crafts (Intensive) (6 q.h.)

The equivalent of 63.323 and 63.324.

63.326 Media Resources and Techniques (3 q.h.)

Designing overlays, transparencies, posters, brochures, and other materials. Use of slides and tapes. Learning the operation of P.A. systems; the 16 mm,

opaque film strips, and overhead projectors; and other photographic devices.

63.327 Therapeutic Use of Dramatics (3 q.h.)

Reinforcement and socialization through pantomime, improvisations, puppetry, skits and stunts, dramatic games, storytelling, one-act plays, with emphasis on creativity in the therapeutic setting.

63.330 The Process of Aging (3 q.h.)

The psycho-social dynamics of growing old, physical changes as a result of aging, needs of elderly people, attitudes toward work, retirement, and leisure. A study of dependency, remotivation, death and dying, as well as programs and services that add quality to the long life.

63.331 The Nursing Home Experience (3 q.h.)

Exchange of empirical data relating to case experiences and institutional procedures encountered by activity leaders and other practitioners in nursing homes. Feasibility of functional innovations will be discussed in relation to present practices.

63.332 Therapeutic Recreation in Rehabilitation (3 q.h.)

Philosophy, goals, and background in rehabilitation and team membership concepts. The role of therapeutic recreation in the acute and chronic hospital, the rehabilitation center, and various community settings.

63.334 Outdoor Education for the Handicapped (3 q.h.)

Basic goals, processes, and considerations of camping for this special population. Emphasis on social integration with nonhandicapped children. If conducted in the summer session, most classes will be held at the Warren Center in Ashland for more contact with the campers and the Warren program, which is sponsored by the Recreation and Leisure Studies Department of Boston-Bouvé College.

63.335 Activity and Movement Analysis (3 q.h.)

Basic anatomy as it relates to the identification of muscle groups involved in action. Analysis of both the movement and the ingredients of the activity and their suitability with given disabilities. *Prereq.* 18.424.

63.336 Mental Illness and Retardation (3 q.h.)

The origins, manifestations, and treatment approaches for mental illness and retardation are explored. Historical and contemporary overviews include treatment settings, case studies, and trends in mental illness and retardation.

63.337 Therapeutic Recreation in Child Development (3 q.h.)

Growth and development patterns, diagnosing early childhood abnormalities; study of the need for play, learning through play, therapeutic values of play, social ethics, safety considerations, and others.

63.340 Leisure Counseling (3 q.h.)

Remedial and developmental process designed to produce behavioral and attitudinal changes in the leisure use patterns of the client. Development of competence in identification, utilization, and referral to appropriate recreational resources. Awareness of cross-cultural recreation patterns. Leisure counseling fundamentals compared in a variety of recreational settings. *Prereq.* 63.303 or one year professional experience or permission of instructor.

63.341 Humanistic Approaches to Recreational Therapy: Noncompetitive and Intergenerational* (3 q.h.) (formerly Eclectic Approaches to Client Treatment)

Provides students with a concrete understanding of the use of trust, imagination, verbal/nonverbal communication, and creative thinking in working with children, senior citizens, and adults of all ages. Designed to increase the student's personal growth, a large variety of behavioral methods will be explored, including: re-motivation and reality therapy, the creative arts, intergenerational programming, the group process, motor coordination, sensory awareness, and success-oriented/self-responsibility program development. *Prereq.* 63.301.

63.343 Community Recreation for the Handicapped (3 q.h.)

Developing and initiating a comprehensive special needs program in the community. Integrating efforts with school and special education departments, municipal officials, and parent groups. Needs statements, concepts of budgeting and funding, publicity, program awareness and support, and actual presentation of integrative and special programs to be included. Site visits are an integral part of the course. *Prereq.* 63.301.

73: Pharmacy and Allied Health Professions**73.316 Pharmacodynamics** (3 q.h.)

A course for registered nurses. Introductory expositions of pharmacologic principles with the pharmacotherapeutics of drug groups and individual drug substances of particular importance in treatment and diagnosis of disease.

86:, 87: Health Professions Programs

The following courses are open to all Health Professions students:

86.300 Medical Terminology Survey (3 q.h.)

An introductory survey to medical terminology. (*Not open to medical record students.*) *Prereq.* Courses in *Anatomy and Physiology*.

86.301 Medical Terminology 1 (2 q.h.)

An intensive introduction to medical terminology, including stems, prefixes, and suffixes. Practice in usage. *Prereq.* Courses in *Anatomy and Physiology*.

86.302 Medical Terminology 2 (2 q.h.)

A more extensive and in-depth consideration of medical terminology. Intended for the medical record specialist. *Prereq.* 86.301.

86.303 Foundations of Medical Science 1 (3 q.h.)

Study of major disease problems in our society and modes of treatment. Discusses organized care, diagnosis, and treatment. Topical emphasis on reproduction, birth, and pediatrics. *Prereq.* Course in *Anatomy and Physiology*.

86.304 Foundations of Medical Science 2 (3 q.h.)

A continuation of 86.303, emphasizing dental health, dermatology, heart disease, cancer, stroke, blood and lymphatic diseases, accidents, and musculo-skeletal, respiratory, and gastro-intestinal diseases. *Prereq.* 86.303.

86.305 Health Science Statistics (3 q.h.)

Designed to give the health practitioner the opportunity to learn the application of basic statistical techniques to be utilized in gathering, displaying, and interpreting health data. The principles of research design are considered. Agencies involved in collecting statistical data will be reviewed. *Prereq.* College math course.

86.306 Hospital Law and Ethics (3 q.h.)

A study of important legal principles and rulings of importance to medical administrative personnel and others. Brief introduction to interpersonal ethics in patient care.

86.307 Hospital Organization and Management 1 (3 q.h.)

Examination and use of general management concepts in a health care context. Case method used to explore marketing, human behavior in organizations, managerial economics, production and operations management, environmental analyses, and policy problems of professional service organizations.

86.308 Hospital Organization and Management 2 (3 q.h.)

Continuation of 86.307, with emphasis on organizational issues and developmental use of long-range planning framework, which ties previous areas together. Case method utilized. *Prereq.* 86.307.

86.310, 86.311 Applied Health Care Management 1, 2 (6 q.h.)

Practical application of management principles in health care agencies. Students will examine potential problem areas in health care management settings in order to plan strategies to develop, implement, and evaluate job tasks for an efficient work environment. *Prereq.* 86.308.

86.312 Communications for Health Care Personnel 1 (3 q.h.)

A two-part course blending the demands of careful interviewing techniques, thorough record keeping, and

accurate and articulate health correspondence. Emphasis placed on effective interaction between patients and health personnel, and between health workers and staff members of health agencies. Deals with the means of effecting good communicative skills with community resources for the benefit of patients.

86.313 Communications for Health Care Personnel 2 (3 q.h.)

Continuation of 86.312. *Prereq.* 86.312 or permission of instructor.

86.320 Principles and Practices of Community Health 1 (3 q.h.)

An overview of specialized health care facilities and their impact on health care delivery, including special focus on ambulatory care, neighborhood health centers, HMOs, and other developing modalities.

86.321 Principles and Practices of Community Health 2 (3 q.h.)

Continuation of 86.320, with emphasis on innovative approaches to meeting and responding to community health needs. *Prereq.* 86.320.

86.322 Principles and Practices of Community Mental Health (3 q.h.)

An introduction to the basic principles and techniques of modern mental health practice.

86.323 Public Health 1 (3 q.h.)

Principles of public health. Organization of health agencies and services.

86.324 Public Health 2 (3 q.h.)

Continuation of 86.323, emphasizing community organization for health services.

86.325 Health Care Delivery (3 q.h.)

A survey course dealing with current and future problems in health delivery.

86.326, 86.327 Contemporary and Controversial Health Care Issues 1, 2 (6 q.h.)

A survey of contemporary health topics. Timely issues are analyzed to differentiate fact and opinion. Designed for individuals desiring authentic information on current health matters. General and mental health topics will be covered.

86.328 Home Health Care (3 q.h.)

Designed to cover all aspects of providing effective community home health care and the impact of these programs on the health care delivery system.

86.329 Environmental Problems and Health (3 q.h.)

A survey of environmental conditions in land, air, and water. The causes of pollution, its effects on humans and other life, and a general discussion of current control methods. Particular emphasis on the significance of environmental problems to the individual.

86.330 Health Science Education 1 (3 q.h.)

Introduction to program planning and the development of educational objectives, with special focus on the use and process of evaluating objectives. Presentation of teaching strategies for the professional practitioner.

86.331 Health Science Education 2 (3 q.h.)

Continuation of 86.330, with emphasis on the use of the media and the design of learning packages in health education. *Prereq.* 86.330.

86.332 Methods and Materials in Public Health Education (3 q.h.)

An introduction to health education in the public health context. *Prereq.* Public Health course or permission of instructor.

86.333 Medical Care and Current Social Problems 1 (3 q.h.)

Seminar course discussing society's organization to deliver medical care services.

86.334 Medical Care and Current Social Problems 2 (3 q.h.)

A continuation of 86.333, discussing topics identified in the first part of the course as matters of great concern in the field of medical care. *Prereq.* 86.333.

86.337 Oral Microbiology (3 q.h.)

The qualitative and quantitative composition of the microbiota inhabiting the various ecologic niches of the oral cavity. Methods that have been used to study the oral microbiota are critically evaluated. Ecologic factors such as adhesion, growth factors, and physico-chemical environment controlling the establishment of colonization of organisms in such sites are discussed in detail. The pathogenic potential of plaque microorganisms in terms of caries, periodontal disease, and mixed anaerobic infections will be evaluated. *Prereq.* Chemistry, Microbiology I.

86.338 Advanced Periodontology 1 (3 q.h.)

Study of the diagnosis, treatment, and control of periodontal diseases, starting with a review of the structure and purposes of the periodontal tissues. Emphasis on the extended functions of the dental hygienist in the recognition and treatment of disease, motivation and instruction of the patient, and periodontal maintenance therapy. Topics for discussion include mucogingival problems, furcation involvements, acute gingival infections, root planing, and gingival curettage. Individual study for the preparation of a paper on a topic of special interest to the student. *Prereq.* Certificate from a dental hygiene curriculum.

86.339 Advanced Periodontology 2 (3 q.h.)

Continuation of 86.338, including in-depth study of the special topics selected for term papers in 86.338. Other topics covered include periodontic-endodontic lesions, trauma from occlusion, bruxism, and oral manifestations of systemic conditions or treatments such as those produced by diabetes, immunosuppressive drugs, hor-

mones, and effects of aging. Readings based on current journal research reports. *Prereq.* 86.338.

86.340 Long Term Care Administration 1 (3 q.h.)

See 86.440 Long Term Care Administration A

86.341 Long Term Care Administration 2 (3 q.h.)

See 86.441 Long Term Care Administration B

86.342 Long Term Care Administration 3 (3 q.h.)

See 86.440 Long Term Care Administration A

86.343 Long Term Care Administration 4 (3 q.h.)

See 86.442 Long Term Care Administration C

86.344 Long Term Care Administration 5 (3 q.h.)

See 86.442 Long Term Care Administration C

86.345 Long Term Care Administration 6 (3 q.h.)

See 86.441 Long Term Care Administration B

86.346 Advanced Health Care Nutrition (3 q.h.)

Food chemistry, nutrition, and physiology as applied to diet. Recent developments in normal nutrition. A critical review of the literature, with emphasis on the experimental data on which the principles of human nutrition are based. Emphasis on the concept for people of all ages. *Prereq.* Basic Nutrition course.

86.347 Advanced Pharmacology (3 q.h.)

Available for students who have completed 86.381 or its equivalent.

86.348 Health Care Financing 1 (3 q.h.)

Introduction to health care accounting, control, and finance, including third-party reimbursement of hospitals.

86.349 Health Care Financing 2 (3 q.h.)

Continuation of 86.348, including a four-step process for control (planning, programming, budgeting, and control), financial issues (capital budgeting, cash budgeting), and other financial analyses.

The following courses are open to Medical Record students only:

86.370 Medical Record Science 1 (6 q.h.)

Introduction to medical records, history of the medical record, and medical record forms. A study of the professional medical record administrator and his/her relationship to the health facility. A study of the numbering, filing, and security of medical records. Quantitative analysis of the record is stressed; didactic and laboratory experiences incorporated. *Prereq.* 80 q.h. including 18.424, 18.425, 18.426, 86.301, and 86.302.

86.371 Medical Record Science 2 (6 q.h.)

Principles of law as related to patient care and medical records. Rules of privileged communication and the release of information to agencies are stressed. Medical staff and committees are covered. Accreditation regulations are considered; didactic and laboratory experiences incorporated. *Prereq.* 86.370.

86.372 Medical Record Science 3 (6 q.h.)

Study of the basic principles for compiling statistics for hospital and health facilities. Preparation of reports and vital statistic reporting are taught. Classification theory and the principles of disease coding are covered. Special indexes are reviewed; didactic and laboratory experiences incorporated. *Prereq.* 86.371.

86.353 Organization of the Medical Record Department 1 (3 q.h.)

The study of the hospital, patterns of organization, lines of responsibility and authority, medical staff and administrative organization, departmental functions, and organization. The planning aspects of management and the study of fundamental principles and successful practices in getting office work accomplished are stressed. *Prereq.* 86.372, 86.362 and 86.375 or permission of Clinical Coordinator.

86.354 Organization of the Medical Record Department 2 (3 q.h.)

Office management problems and their solution, conceptive framework for the operation of essential management function, facilities, solutions, and contributions to the office. The study of the controlling function in the Medical Record Department. Quality control, time standards, cash controlling, budgeting and office manuals. Work simplification and systems as they apply to the Medical Record Department. *Prereq.* 86.353.

86.373 Medical Record Science 4 (6 q.h.)

A study of health care legislation, quality assurance, utilization review, PSROs, planning agencies and their impact on record management; an introduction to specialized record systems; didactic and laboratory experiences incorporated. *Prereq.* 86.372.

86.374 Medical Record Science 5 (6 q.h.)

Specialized record systems continued. Topics include ambulatory care, home care, and long-term care. These topics are approached in terms of information management and quality assurance. Discussion of new problems presented by changing patterns in health care delivery. Review of current literature. *Prereq.* 86.373.

86.358 Medical Record Computer Science (3 q.h.)

Electronic data processing applications in the medical record environment. The study of the hospital information system. Application of computers in hospital methodology and assessing the need for EDP in medical record environment. Trends in the state of the art and future prospects for medical record management. *Prereq.* 49.310, 86.374.

Students applying for the clinical sequence of courses 86.375, 86.360, and 86.367 must have a quality point average of 2.5 and the approval of their assigned Health Record Program adviser.

86.375 Applied Medical Record Science 1 (2 q.h.)

Clinical practice in medical record science and management techniques at one or more of the affiliated hospitals. *Prereq.* 86.372.

86.360 Applied Medical Record Science 2 (3 q.h.)

Clinical practice in medical record science and management techniques at one or more of the affiliated hospitals and health facilities. *Prereq.* 86.375.

86.367 Applied Medical Record Science 3 (formerly 86.376) (4 q.h.)

Clinical practice in medical record science and management techniques at one or more of the affiliated hospitals. *Prereq.* 86.360.

86.362 Hospital Management for Medical Record Administrators (3 q.h.)

An introduction to the basic management principles designed so that the health care facility will be the major source of example and case study (for Medical Record students only.)

86.368 Topics in Health Records (3 q.h.)

A seminar on current issues in health documentation. Open to health records students.

86.363 Special Topics in the Health Professions 1 (3 q.h.)

Independent study course to enable the student in health science, health management, and health records to focus on areas of special relevance to his/her professional goals. Materials will be developed with the aid of a faculty adviser to reflect the student's special background and needs. Arrangements should be made with the faculty adviser prior to registration for the course. *(Not open to Medical Laboratory Science students.)*

86.364 Special Topics in the Health Professions 2 (3 q.h.)

A continuation of 86.363. *(Not open to Medical Laboratory Science students.)*

86.365 Special Topics in the Health Professions 3 (3 q.h.)

A continuation of 86.364. *(Not open to Medical Laboratory Science students.)*

86.366 Special Topics in the Health Professions 4 (3 q.h.)

A continuation of 86.365. *(Not open to Medical Laboratory Science students.)*

86.380 Basic Nutrition (3 q.h.)

For students in the health field enrolled in their first nutrition course. Provides an overview of nutrition as a young, growing science. The course's focus will be on current basic scientific knowledge of nutrition and how this knowledge can be applied to guide an individual toward making appropriate food choices. It is assumed the student will possess a high school background in chemistry and biology.

86.381 Basic Pharmacology (3 q.h.)

The major purpose of this introductory course is to supply sound and current knowledge of the major classes of drugs. Wherever possible, a presentation of the mode of action, common side effects, dosage, pharmaceutical forms, rate and route of administration, and known

interactions and toxicities will be made of the most commonly and currently used drugs to treat certain diseases or specific signs and symptoms. *Prereq.* *Chemistry, Anatomy, and Physiology; or permission of instructor.*

86.440 Long-Term Care Administration A (formerly 86.340 and 86.342) (6 q.h.)

The organization of care for the long-term and chronically ill patient. Goals and purposes of types of long-term care facilities. Design of long-term care facilities; budgeting, financing, capital funding; administration.

86.441 Long-term Care Administration B (formerly 86.341 and 86.345) (6 q.h.)

Internal and external systems pertinent to the long-term care facility. Examination of the components of the internal system, including the nursing unit, role of the physician, the therapies, etc. Examination of the components of the external system, including licensing agencies, hospitals, and the community. Methods for improvement of services will be discussed. *Prereq.* 86.440 or equiv. or special permission of Director of Health Professions Programs.

86.442* Long-Term Care Administration C (formerly 86.343 and 86.344) (6 q.h.)

The nature and problems of aging, individual and social considerations. The care of the elderly in the home, community, and institutions. Overview of long-term care institutions and their impact on the health care industry. General survey and summary of the Massachusetts Nursing Home Administrators Licensure Examination. *Prereq.* 86.441 or equiv. or special permission of Director of Health Professions Programs.

The following courses are open to Radiologic Technology students only:

86.420 Radiologic Technology Orientation 1 (3 cl., 3 q.h.)

A study of the history of x-radiation, radiology department organization, medical terminology, patient care and nursing procedures, and contrast media.

86.421 Radiologic Technology Orientation 2 (3 cl., 3 q.h.)

A study of medical and surgical diseases. *Prereq.* 86.420.

86.422 Radiologic Science 1 (4 cl., 4 q.h.)

A survey of the basic concepts of physics, units of measurement, Newton's law of motion, work, energy, atomic theory of matter, electric currents, magnetism, generators, motor production, control of high voltage, and x-ray production. *Prereq.* 10.627 or equiv.

86.423 Radiologic Science 2 (4 cl., 4 q.h.)

Interaction of x-rays and matter, modern x-ray tubes, x-ray circuits, simulator experiments, fluoroscopic systems, properties of solids, liquids, and gases. Temperature and heat transfer and their application. *Prereq.* 86.422.

86.424 Principles of Radiology 1 (4 cl., 4 q.h.)

A study of practical, basic radiation protection and principles of positioning patient for radiographic studies.

86.425 Principles of Radiology 2 (4 cl., 4 q.h.)

A study of the principles of precise body positioning for detailed radiographic studies. *Prereq.* 86.424.

86.426 Radiologic Photography and Exposure 1 (4 cl., 4 q.h.)

A study of the basic principles of image formation, electromagnetic spectrum, x-ray tube construction, factors controlling radiographic quality. *Prereq.* 10.627 or *equiv.*

86.427 Radiologic Photography and Exposure 2 (4 cl., 4 q.h.)

A study of accessory items used to improve radiographic quality; in-depth methods of protection for patient and personnel; film critique and mathematical exposure concepts. *Prereq.* 86.426 and 86.422.

86.434 Advanced Radiologic Technology 1 (3 cl., 3 q.h.)

A study of special procedures involving cardiac vascular procedures, neuroradiology, lymphangiography; other related procedures. *Prereq.* Core curriculum in *Radiologic Technology* or its equivalent. Available late afternoon.

86.435 Advanced Radiologic Technology 2 (3 cl., 3 q.h.)

A continued study of special procedures. *Prereq.* 86.434. Available late afternoon.

86.648, 86.649, 86.650, 86.651 Radiologic Practicum (12 q.h.)

Application of theoretical principles by performing radiographic procedures under supervision. Assigned homework to be part of lesson plans received while at the hospital; lectures presented at the hospital and University. Program requirement minimum 2 hrs./week.

86.628 Imaging Modalities (3 q.h.)

Surveys imaging modalities other than diagnostic x-ray, including xerography, thermography, nuclear medicine, radiation therapy, computerized axial tomography, and ultra sound. *Prereq.* 86.427. Available late afternoon.

86.629 Radiation Protection—Radiobiology (3 q.h.)

Covers atomic structure, properties of radioactive materials, units of radiation, long-term/short-term biological effects, survey instruments, reduction of exposure to patients, federal x-ray standards, and radiopharmaceuticals. *Prereq.* 86.427. Available late afternoon.

Medical Laboratory Science courses open to all students:**87.300 Medical Laboratory Science Orientation** (2 q.h.)

Scope, responsibilities, opportunities, and educational requirements for the medical laboratory science professions.

87.301 Quality Control (3 q.h.)

The development of quality control programs in each medical laboratory specialty. Applications of statistical methods to medical laboratory quality control programs.

87.303 Seminar in Medical Technology (3 q.h.)

Current topics in medical technology. Required readings and presentations by students. Guest lecturers. *Prereq.* Permission of instructor.

87.310 Hematology (1 cl., 3 lab., 3 q.h.)

Basic hematological techniques, including discussion of the differential smear and observation of the normal morphology of human red cells, white cells, and platelets. *Prereq.* 18.412 or *equiv.* (Laboratory fee) (Not for Medical Technology or Hematology majors.)

87.311 Morphologic Hematology 1 (1 cl., 3 lab., 3 q.h.)

Morphologic and etiologic classification of the anemias. Related diagnostic tests will be discussed. *Prereq.* 86.310 or *equiv.* (Laboratory fee)

87.312 Morphologic Hematology 2 (1 cl., 3 lab., 3 q.h.)

Studies of pathologic and physiologic deviations of the white cell series as observed in leukemias and infections. Some animal hematology is included. *Prereq.* 87.311 or *equiv.* (Laboratory fee)

87.313 Epidemiology 1 (3 q.h.)

Basic concepts in epidemiology, the distribution in determinants of diseases and injuries in human populations. Descriptive and analytical epidemiology studies will be included.

87.314 Epidemiology 2 (3 q.h.)

Study of the microbiological distributions in determinants of infectious diseases; hospital epidemiology.

The following courses are open to Medical Laboratory Science students only:

†Courses offered in the evening at Basic College tuition rates.

†87.160 Basic MLS Urinalysis (1 cl., 3 lab., 2 q.h.)

Principles and theories of renal physiology, with laboratory emphasis on techniques for chemical and microscopic detection of normal and abnormal urinary tract constituents. *Prereq.* 8 q.h. of college biology and chemistry.

†87.161 Basic Hematology 1 (1 cl., 3 lab., 2 q.h.)

Introductory course in basic hematology procedures and principles: hemoglobin, hematocrit, white and red blood cell counts, and white cell differentiation. *Prereq.* 8 q.h. of college biology and chemistry.

†87.102 Basic Hematology 2 (1 cl., 3 lab., 2 q.h.)

Principles and procedures of basic coagulation and blood cell morphology. *Prereq.* 87.161.

†87.103 Basic Medical Laboratory**Immunohematology** (1 cl., 3 lab., 2 q.h.)

Basic principles in immunohematology and related techniques, with particular emphasis on those procedures used in blood banking. *Prereq.* 8 q.h. of college biology and chemistry.

†87.104 Basic Medical Laboratory Clinical**Microbiology** (3 cl., 3 lab., 4 q.h.)

Basic principles and techniques of organism isolation; cultivation and identification of staphylococci, streptococci, enterobacteria, and neisseria. Clinical specimens will be examined and identification schema developed. *Prereq.* 87.101 and 8 quarters of college biology.

†87.105 Basic Medical Laboratory Science**Chemistry and Instrumentation** (3 cl., 3 lab., 4 q.h.)

Principles, procedures, and techniques of basic clinical chemistry and instrumentation. *Prereq.* 87.101 and 12.427.

†87.113 Basic Medical Laboratory Science**Immunology** (2 cl., 3 lab., 3 q.h.)

Basic principles of immunology. Laboratory emphasis on immunodiagnostic techniques currently used in clinical laboratory practice.

†87.211 Hemostasis (1 cl., 3 lab., 2 q.h.)

Advanced studies in the hemostatic mechanisms. Platelet function analyses, identification of factor deficient samples, and problem-solving situations.

†87.213 Immunohematology (1 cl., 3 lab., 2 q.h.)

Advanced studies in antigen-antibody detection and problem solving of immunohematological tests. Discussion of related hematologic disorders. *Prereq.* 87.103 or 87.153.

†87.222 Histochemistry (1 cl., 3 lab., 2 q.h.)

The use of histochemistry stains to differentiate among various hematologic diseases. Stains to include peroxidase, sudan black B, NBT, esterases, and immunofluorescence. *Prereq.* 87.312 or 87.252.

Courses open to Cytotechnology students only:

A special tuition rate applies to the following Cytotechnology courses.

87.508 Introduction to Cytotechnology (2 cl., 2 q.h.)

A review of cell structure, principles of microscopy, and staining techniques. Anatomy and physiology of the female reproduction system and study of the nonmalignant cytology of the female genital tract. (Laboratory fee)

87.528 Cytopathology 1 (2 cl., 2 q.h.)

Cytopathology and clinical aspects of cervical dysplasia, carcinoma-in-situ, and invasive squamous cell carcinoma. Consideration of endometrial and endocervical carcinoma, other genital tract cancers, and radiation effect. *Prereq.* 87.508. (Laboratory fee)

87.538 Cytopathology 2 (2 cl., 2 q.h.)

Benign and malignant cytology of the respiratory and gastrointestinal systems, correlated with the anatomy and physiology. Considerations of clinical aspects. Special collection techniques. Emphasis on cancers of the lung and stomach. *Prereq.* 87.528.

87.558 Cytopathology 3 (2 cl., 2 q.h.)

Study of benign, atypical, and malignant cells exfoliated from various portions of the urinary tract, in serious effusion, cerebrospinal fluid, and breast secretions. *Prereq.* 87.538.

87.518 Applied Cytology 1 (at Hospital) (4 q.h.)

The microscopic evaluation and screening of benign cytological smears and smears from cervical dysplasia, carcinoma-in-situ, invasive malignant tumors of the female genital tract.

87.548 Applied Cytology 2 (at Hospital) (4 q.h.)

The microscopic evaluation and screening of cytological smears from the respiratory tract, gastrointestinal tract, urinary tract, and from body fluids. Continuing evaluation of cytological smears from the gynecological tract.

87.578 Applied Cytology 3 (at Hospital) (4 q.h.)

The microscopic evaluation and screening of cytological smears from all parts of the body. Practical experience in genetic cytology.

87.618 Applied Cytology 4 (at Hospital) (2 q.h.)

The microscopic evaluation and screening of cytological smears from various body sites. Effects of radiation and of chemotherapy, diagnosis of suspicious and hormonal conditions, cytological observations in pregnancy and their clinical significance.

87.568 Cytogenetics and New Concepts (2 cl., 2 q.h.)

Clinical and cytological aspects of genetics, including genetic counseling, special uses of cytology, cell research techniques, cancer, epidemiology, and current concepts related to cytotechnology. *Prereq.* 87.558 or permission of instructor. (Laboratory fee)

87.598 Special Topics (2 cl., 2 q.h.)

Special projects in cytology, cytopathology, or cytotechnology investigated or reviewed and reported by student. Written and oral presentation required. *Prereq.* 87.558 or permission of instructor.

87.608 Seminar: Cytopathology—Criteria and Correlations (4 cl., 2 q.h.)

Presentation, discussion, and interpretation of benign, suspicious, and hormonal conditions. The cytological diagnostic criteria of malignant tumors from various body sites and their histopathological correlation.

90: Career Planning and Development

Self-Assessment and Career Development

90.401 Self-Assessment and Career Development 1 (3 q.h.)

Understanding the concept of life/career planning and its practical implications for future education and/or work. Students complete a self-assessment, including an evaluation of their competencies and skills, and receive training in career decision making with practice in the use of field survey techniques to test their interest in specific career areas. An overview of job campaigning, including an introduction to résumé preparation and interviewing techniques.

90.402 Self-Assessment and Career Development 2 (3 q.h.)

An expanded understanding of life/career planning. Intensive practice in several job campaign skills, including résumé building, interviewing for information, networking, and interviewing for a job. Students can become aware of how these and other job campaign strategies can be used to map an individual approach to career development. Emphasis is placed on the relation of strategic career decisions to life planning, in terms of both short-term and long-term goal development.

Core Career Courses for Women

* Title change only. Students who have taken this course under its former title should not enroll.

These courses are available on an open and equal opportunity basis to all students who wish to enroll.

90.301 Planning a Business Career* (3 q.h.)

Helps students develop career decision-making skills. Students participate in exercises to assist in identifying and evaluating their interests, values, skills, and competencies. Resources and strategies are presented to help women research various business careers, including practice in the area of field survey techniques to test their interest in specific career areas. Résumé preparation and interviewing techniques are also introduced.

90.305 Women in Business Organizations 1: Structural and Behavioral Fundamentals* (3 q.h.)

Identification of effective management practices and the inhibiting factors that impede women from acquiring them. The importance of effective communication and dealing with criticism will be stressed. Validity of common behavioral assumptions will be tested, including women's fears of success, inadequate motivation, social exclusion, disinclination to take charge or withstand pressure.

90.306 Women in Business Organizations 2: Leadership and Communications* (3 q.h.)

The dynamics of leadership as they relate to the successful woman manager: managing conflict, securing control, instituting change, motivating, disciplining, and

gaining respect. Distinguishing supervisory from management performance standards. Role playing and case studies will assist in the development of leadership and problem-solving capabilities. *Prereq.* 90.305 or *equiv.*

90.310 The Elements of Management (3 q.h.)

Provides a knowledge base of the technical, quantitative, and specialized areas of management. Familiarizes the student with the language and operational complexities of the manager's job and raises her level of diagnostic, analytic, and integrating competence. The course is divided into four three-week modules: Module I: Economics and Finance; Module II: Budget and Accounting; Module III: Marketing; Module IV: Information Systems.

90: Law Enforcement

94.301 Human Rights in Corrections (3 q.h.)

Consideration of the special practices and problems in the protection of human rights in the institutional environment; legal and practical aspects.

94.302 Basic Statistics in Law Enforcement (3 q.h.)

Basic statistical information procedures and operations relating to law enforcement. Interpretation of criminal statistics, crime rates, unrecognized crime, non-reporting, recidivists' rates, individual statistics, evaluation of records, research and data on specialized services.

94.303 Correctional Counseling (3 q.h.)

Basic concepts and principles of counseling; individual and group therapy carried on in the correctional field and institutional services; case study and projects.

94.304 Criminal Investigation and Case Preparation 1 (3 q.h.)

General investigation techniques; collection and preservation of evidence and information; consideration of particular crimes, including arson, sexual offenses, larceny, burglary, robbery, forgery, and homicide.

94.305 Criminal Investigation and Case Preparation 2 (3 q.h.)

Conduct of raids, surveillance, and undercover operations, methods of preparing a case for court, specialized scientific methods, exercises involving techniques of prosecution and cross-examination. *Prereq.* 94.304.

94.306 Comparative Police Systems (3 q.h.)

A study of existing police systems in other jurisdictions; examination of the organization, administration, and practices in police agencies in the United States, Europe, and the United Kingdom.

94.307 Introduction to Industrial Security (3 q.h.)

The historical, philosophical, and legal basis of security; a survey of administrative, personnel, and physical aspects of the security field.

94.308 Interviews and Interrogations 1 (3 q.h.)

Interviewing of victims, witnesses, informants, and complainants; demonstration, study, discussion, and practice of techniques and procedures.

94.309 Interviews and Interrogations 2 (3 q.h.)

Techniques for legally acceptable questioning of suspects and persons in custody; laws governing interrogation practices; demonstrations, class exercises, and assigned projects. *Prereq.* 94.308

94.311 Advanced Correctional Practices 1 (3 q.h.)

Diagnosis and treatment of the drug addict and the alcoholic offender at both juvenile and adult levels; a study of these and related kinds of personal self-abuse as to causation and treatment.

94.312 Advanced Correctional Practices 2 (3 q.h.)

Case studies of persons confined; their past and present environment; consideration of purposeful resolves or regressions. A study and evaluation of correction-psychiatric facilities for the disordered offender, including the aggressive, the assaultive, and the violent subject. *Prereq.* 94.311.

94.314 Traffic Safety and Control 1 (3 q.h.)

A study of the state of the art of highway safety, research, traffic accident investigation, prevention, rescue, automated system of vehicular traffic accident and moving violation data collection, analysis and utilization, speed control, speed zoning techniques, radar, vascar, laws, rules, and regulations.

94.315 Traffic Safety and Control 2 (3 q.h.)

An in-depth study of traffic law enforcement, techniques of selective enforcement, traffic surveys, engineering, safety education, and evaluation of current traffic programs. *Prereq.* 94.314.

94.316 The Law and Institutional Treatment (3 q.h.)

The process of law from arrest of offender through release in its relation to correctional principles and practices; functions of police, defense, prosecution, and courts; legal documents related to commitment.

94.317 Comparative Correctional Systems (3 q.h.)

A study of correctional systems and methods in selected jurisdictions; examination of the organization, administration, and practices in the United States and foreign countries.

94.318 Law Enforcement Identification and Records 1 (Criminal Histories System) (3 q.h.)

Records and systems utilization; survey of forms, files, procedures, and standards, with an introduction to the criminal histories systems concept and the applicability of C.O.R.I. (criminal offenders record information) in law enforcement record keeping.

94.319 Law Enforcement Identification and Records 2 (Criminal Histories System) (3 q.h.)

Theories and practices in personal identification principles; survey and evaluation of present and new iden-

tification techniques; introduction to public records, fair information practices, and exceptions in law enforcement. *Prereq.* 94.318.

94.320 Police Public Relations (3 q.h.)

The principles of sound public relations for the entire police operation; writing, public speaking, conferences, and all news media; consideration of police image and public opinion.

94.321 Police Community Relations (3 q.h.)

A survey of the role and function of police in intergroup relations; human relations and minority groups; responsibilities of police regarding civil rights, civil disorders, and public protection.

94.322 Research Methods in Criminal Justice (3 q.h.)

A research project related to some specific police or correctional interest or operation, in consultation with the faculty adviser. Course meets at discretion of the instructor. Project paper required for grade.

94.323 The Patrol Function 1 (3 q.h.)

The planning process related to the administration of the patrol function. Consideration of theoretical and operational aspects of various patrol systems: random patrol, response force, split force, team policing; probability theory; and the relation between patrol and crime levels.

94.324 The Patrol Function 2 (3 q.h.)

A continuation of 94.323, with emphasis on the goals and objectives of police patrol management models. Discussion and analysis of manpower, work load, response time, patrol communications, preventive strategies, and inputs and outputs of patrol systems evaluated in quantitative form. *Prereq.* 94.323.

94.325 Introduction to Criminalistics 1 (3 q.h.)

A survey of the elements of microscopy, spectroscopy, and chemistry as applied to trace evidence in criminal investigations, responsibilities of technician, investigator, and others.

94.326 Introduction to Criminalistics 2 (3 q.h.)

Toxicology and serology; procedures related to other physical evidence; laboratory demonstrations and practical exercises. *Prereq.* 94.325.

94.327 The American Correctional System (3 q.h.)

A critical survey of the correctional field, covering probation, institutions, and parole, including historical development, program content, and current problems and needs.

94.328 Social Deviance (3 q.h.)

A consideration of the social problems of social disorganization, mental disorders, drug addiction, alcoholism, suicide, and sexual behavior.

94.329 Social Deviance 2 (3 q.h.)

Continuing consideration of world's population crisis, race and ethnic relations, family disorganization, work and automation, poverty and disrepute, war and disarmament. *Prereq.* 94.328.

94.330 Treatment of Offenders 1 (3 q.h.)

The concept of treatment and corrections; history; classification; training, education, and guidance; treatment methods; inmate society; health and social services.

94.331 Treatment of Offenders 2 (3 q.h.)

Therapy, psychiatric and psychological considerations, case studies, evaluation of comparable methods. *Prereq.* 94.330.

94.332 Correctional Administration 1 (3 q.h.)

Correctional processes and services, standards, personnel, principles of management, allocation of resources, training of staff. Study of regular and special programs, volunteers, and outside contracts.

94.333 Correctional Administration 2 (3 q.h.)

A further study of the principles of management; sentence reduction, discharge planning, and work release administration. Types of institutions; compacts; regional concepts, planning, organizing, controlling and directing corrections, budgeting. *Prereq.* 94.332.

94.335 Investigative Report Writing (3 q.h.)

Report content and writing, exercises in accurate terminology and concise reporting, interpretation and evaluation of information, practical report-writing projects.

94.336 Police Supervision (3 q.h.)

The police supervisor's role in discipline, interdepartmental relations; problem handling and personnel policies; problems in supervisory relationships; wages, grievances, morale, and safety.

94.337 Police Work with Juveniles (3 q.h.)

The role of the police in delinquency prevention, with emphasis on theory, administration, control, treatment, confinement, community resources, and relationships with the public and the juvenile court.

94.338 Criminology 1 (3 q.h.)

An introduction to the study of crime from the perspective of classical and contemporary criminological theories. In particular, attention is given to biological, psychological, and sociological approaches to the explanation of crime.

94.339 Criminology 2 (3 q.h.)

A continuation of 94.338, with emphasis on the causes of crime and the relation between law and crime. Specific implications of prevention, rehabilitation, and treatment are considered in depth. *Prereq.* 94.338.

94.340 Delinquency Prevention (3 q.h.)

A survey of delinquent behavior, causation, and delinquency prevention programs; seminar projects for discussion of specific problems and general principles in establishing delinquency prevention services.

94.341 Probation and Parole Practices 1 (3 q.h.)

The probation officer; pre-sentence investigation; conditions of probation; effectiveness, administrative aspects, and prediction methods; relation to community.

94.342 Probation and Parole Practices 2 (3 q.h.)

The parole officer; conditions of parole; supervision; effectiveness; administrative relationships; relations to the community, court, and law enforcement agencies; relations of probationer and parolee to rehabilitative, social, and family services; consideration of recidivism and aftercare. *Prereq.* 94.341.

94.343 Law Enforcement Management and Planning 1 (3 q.h.)

Philosophy and theories of management in law enforcement; studies of organization from the administrator's viewpoint, including control, efficiency, effectiveness, and discipline.

94.344 Law Enforcement Management and Planning 2 (3 q.h.)

A survey of the administrator's role, including special activities and responsibilities; administrative planning; civilian personnel, including recruitment, selection, evaluation; training; budgets; management records; interpersonal communications; auxiliary services, evaluation of present and future management systems. *Prereq.* 94.343.

94.345 Juvenile Corrections 1 (3 q.h.)

A study of police, detention, petition, and hearings related to juveniles; juvenile court procedures, philosophy, and terminology; adjudication.

94.346 Juvenile Corrections 2 (3 q.h.)

Social workers, probation officers, judges, psychologists, and psychiatrists in relation to juveniles; institutions; aftercare; prevention. *Prereq.* 94.345.

94.350 Document Control (3 q.h.)

A detailed study of procedures for handling and control of classified and other sensitive information; a survey of control systems from manual to semi-automated systems using data processing equipment.

94.351 Industrial Fire Prevention (3 q.h.)

Principles and practices of fire safety, including organization and management responsibility, property conservation, safeguards for construction, fire control apparatus and functions, engineering, and scientific data on fires and related perils.

94.352 Physical Security 1 (3 q.h.)

The basic foundations for security in industry, banking, transportation, utilities, and other nongoverning operations; physical requirements and standards.

94.353 Physical Security 2 (3 q.h.)

Implementation of security; study of inanimate aspects, including alarm and surveillance devices; study of animate aspects of protection. *Prereq.* 94.352.

94.354 Retail Security (3 q.h.)

The operation of security departments, including functions of mercantile establishments; dishonest employees; shoplifters; management and public relations; receiving, shipping, and warehousing; special laws and procedures.

94.355 Bank Security Measures (3 q.h.)

An in-depth study of the principles and practices of security measures for banks and other financial institutions and the preparation of rules establishing minimum standards under current federal and state legislation.

94.356 Seminar in Security (3 q.h.)

An analysis of current problems in security, such as growth patterns, salary structures, training and education, existing weaknesses; field trips, individual study assignments, and required oral and written reports.

94.357 Seminar in Correctional Practices (3 q.h.)

An analysis of current problems in corrections, designed to meet the needs and interests of specific groups of students, practitioners, supervisors, and administrators of correctional programs.

94.358 The National Law Enforcement Seminar (3 q.h.)

An annual, concentrated exploration of current viewpoints, varied solutions, innovative procedures, and critical analyses in the issues facing law enforcement, correctional practices, and security, drawing on exceptionally qualified local and national figures. A research paper under the direction of a faculty adviser is required for credit. (Not offered every year.)

94.359 Seminar in Hospital Security (3 q.h.)

The function of protection in the health industry; medical security administration, including study of health care providers; trends in hospital law; security from injury, fire, and loss in the medical world; security methodology for safeguarding specialty areas; the security role in mass casualty management and emergency preparedness; the concept of professionalism; community liaison; and patient attitudes toward security.

94.360 Current Security Problems (3 q.h.)

An analysis of special problem areas such as security education and training, community relations, white-collar crime, drug abuse, theft control, shoplifting, document control, subversion and sabotage, protection of classified information, control of proprietary information and business espionage, labor problems, civil disturbances, and natural and man-made disasters.

94.361 Law Enforcement Mathematics 1 (3 q.h.)

A review of elementary algebra: algebraic expressions and operations, equations, word problems; solutions to mathematical problems in their practical applications in the criminal justice field. Probability, trigonometry, statistics, ratio, and proportion.

94.362 Law Enforcement Mathematics 2 (3 q.h.)

Further review: fundamental operations, measurement and computation, solutions of linear and quadratic equations. Equations of motion and energy, permutations, combinations. Application of these principles will be applied to most areas of law enforcement. *Prereq.* 94.361.

94.364 Seminar in Law Enforcement—(Youth Crime Control) (3 q.h.)

The criminality and deviance of those between the juvenile and adult age. Consideration is given to concepts and characteristics of the youthful offender, the role of the family in youth crime, the generation gap, violence of youth hooliganism, drug addiction of youth, ordinary crimes of youth, the youth subculture and culture conflict, the role of mass media and education in youth crime, the concepts of freedom and justice in the youth culture, treatment of youthful offenders, and the state of youth crime control in foreign countries.

94.365 Seminar in Law Enforcement—(Victimology) (3 q.h.)

Criminal-victim relationship, with emphasis on victim-precipitated crimes and compensation to the victims. Consideration is given to concept and significance of "victimology," time, space, sex, age, and occupational factors in criminal-victim relationships; victims of murder, rape, other violent crimes, and property crimes; victim typology; the public as victim; restitution to victims of crime; compensation to victims of crime; and the functional responsibility of the victim.

94.366 Seminar in Law Enforcement—(International Crime Control) (3 q.h.)

Crimes touching upon more than one country, with emphasis on international criminal law principles, treason, and espionage. Concentration is given to the concept of law in its comparative aspects, customs, treaties, international conventions, "comity," culture conflicts, the "international personality," the "attempt clause," the Belgian approach, the Oxford approach, asylum and extradition, international ordinary criminals, political criminals, piracy (on sea and in the air), war criminals, genocide, international courts, League of Nations, United Nations, international criminal statistics, Interpol, the Soviet-type spy-schools, the history of American Intelligence.

94.368 Seminar in Law Enforcement—(Operational Intelligence) (3 q.h.)

Designed to give the student the opportunity to understand theoretically the value and function of an intelligence unit, including planning, directing, organizing, financing, and other salient features of the administration of these units. Emphasis is placed on organized crime, subversive activities, and liaison programs as they apply to a modern police agency.

94.370 Seminar in Law Enforcement—(Collective Bargaining) (3 q.h.)

The history and background of collective bargaining in the public sector as it affects members of the law enforcement field; initial establishment of rights of labor, labor legislation—federal and state; preparation for negotiation, resolutions of impasses, final agreement, and operation of the contract.

94.371 Man, Law, and Society 1 (3 q.h.)

A general analysis of the ways in which major changes occur in the established practices of legal and social organizations and communities. Particular concern with the part played by legal institutions in initiating, controlling, and directing or assisting in such changes.

94.372 Man, Law, and Society 2 (3 q.h.)

An introduction to the social science concepts and methods in their current and potential application to social and legal problems. Aims to acquaint the student with a variety of social research concepts and methods of special utility in investigating diverse types of social law-related problems. *Prereq.* 94.371.

94.374 Seminar in Law Enforcement—(Interviewing Practicum) (3 q.h.)

Advanced interrogation methods and procedures; techniques of persuasion; conditioning (negative and positive); the polygraph, its history and methodology; the established rules and procedures required for current diagnosis of truth and deception; the evaluation of the contemporary methods of international law enforcement agencies.

94.375 Seminar in Law Enforcement—(Organized Crime) (3 q.h.)

The nature and problems of organized crime; causes and effects; comparative and historic roots; the activities, organization, and economics; possible solutions; the scope and techniques in combating organized crime.

94.376 Seminar in Law Enforcement—(Minorities and the Urban Crisis) (3 q.h.)

An investigation of the ethnic and racial origins and characteristics of the American people; the interaction, conflicts, and possibilities of adjustment between the dominant society and minority groups, particularly in contemporary urban settings; the role and function of police in their relations with minority groups.

94.377 Seminar in Law Enforcement—(Criminal Behavior) (3 q.h.)

An examination of crime and criminal behavior as a social phenomenon. Three principle divisions: sociology of law and its effect; criminal etiology and the scientific analysis of the causes of crime; evaluation of the various rationales of detention as a crime-control factor.

94.378 Seminar in Law Enforcement—(Prosecutive Development) (3 q.h.)

Lecture and discussion relating to the professional requirements of the modern police officer in the United States, oral testimony, the entire corpus delicti and all other related matters in proper form and sequence, the trial, testimony and the jury, conduct on the witness stand, opposition counsel, the defense of entrapment, opinion testimony, confessions, prospective witnesses, legal standards and the police.

94.379 Seminar in Law Enforcement—(Forensic Laboratory) (3 q.h.)

Crime laboratory organization and utilization of special equipment for the analysis, interpretation, classification, and identification of physical evidence obtained in crime scene searches. The transportation, storage, and security of physical evidence and the effect of the results, coupled with the preparation of exhibits for courtroom presentation. *Prereq.* 94.326. (Laboratory fee)

94.380 Seminar in Law Enforcement—Intervention Strategies and Tactics for Law Enforcement Counseling Techniques) (3 q.h.)

Basic concepts and principles of intervention as a social work method. Nature of therapeutic relationships, principles of communication. Diagnostic assessment of the person-problem-situation configuration. Goal-setting process. Ego-supportive procedures and use of community resources.

94.381 Civil Liberties and the Police 1 (3 q.h.)

An in-depth preparation for the officer facing the practical problems of enforcing the law without breaching the civil rights of the accused and bystanders; individual readings, lectures, group discussions, and preparations from Massachusetts and national interest cases; many incidents pertinent to the actions of the people involved with these problems will be investigated and studied; constitutional interpretation and limitations are the guidelines for the course.

94.382 Civil Liberties and the Police 2 (3 q.h.)

Several Supreme Court cases are followed from the time of the call to the confrontation, arrest, examination in court, appeals, and the direct statements on the problem by jurists of the highest court. The last section of the term ties in the latest criminal law and civil rights act changes including, but not limited to, criminal justice and no-knock laws and the latest Civil Rights Act. *Prereq.* 94.381.

94.383 Seminar in Law Enforcement—(Drugs) (3 q.h.)

Designed to acquaint the student with the needs of law enforcement personnel in the area of drug abuse; the law, society classification, distribution, identification, and the effects of drugs.

94.384 Seminar in Law Enforcement—(Executive Development) (3 q.h.)

The role of the police administrator within the managerial structure. Special problems unique to the law enforcement executive, decision making, policy formation, planning, controlling, communicating, and directing. A consideration of case studies and surveys will be utilized.

94.385 Seminar in Law Enforcement—(Mental Health and the Police) (3 q.h.)

A study of the roles of law enforcement and mental health services. Diagnosis of the triggering mechanisms of behavioral disorders and the suicidal phenomenon; psychiatric and psychological considerations; case studies and the legal process.

94.386 Seminar in Law Enforcement—(Data Processing) (3 q.h.)

An introduction to automated systems utilized in the field of law enforcement, basic program concepts, filing and sorting techniques, available input and output storage media, types and sources of data communications and applications.

94.387 Administration of Justice 1 (3 q.h.)

A survey of the evaluation of justice from the earliest times, developed historically, with particular emphasis on Western justice and American justice, including the roles played by the judiciary, with stress on due process and the constitutional guarantees.

94.388 Administration of Justice 2 (3 q.h.)

An analysis of the various groups and professions in the American justice system. Emphasis is fixed on human relations, efficiency, current trends, and the future role of the American criminal justice system. *Prereq.* 94.387.

94.389 Civil Law in Criminal Justice 1 (3 q.h.)

Civil matters such as defamation, negligence, assault and battery, false confinement, trespass, conversion, and agency relationships.

94.390 Civil Law in Criminal Justice 2 (3 q.h.)

Civil matters such as the law of contracts, bailments, domestic relations, and business relationships that should be known to and distinguished by law enforcement personnel. *Prereq.* 94.389.

94.391 Criminal Law 1 (3 q.h.)

Exploration of the major problems of criminal law as a device for controlling undesirable behavior. Course is intended to give students a working knowledge of the basic questions of public policy involved in the administration of criminal justice and the legal principles of determining criminal liability. Includes a consideration of specific crimes, elements of a crime, parties to a crime, and defenses to a crime.

94.392 Criminal Law 2 (3 q.h.)

Consideration of vital constitutional and statutory concepts, including self-incrimination, search and seizure, law of arrest, criminal procedure and responsibility, confessions, right to counsel, and conduct of trial in the district, superior, appellate, and federal courts. *Prereq.* 94.391.

94.393 Evidence and Court Procedure 1 (3 q.h.)

Rules of evidence, principles of exclusion, evaluation and examination of evidence and proof.

94.394 Evidence and Court Procedure 2 (3 q.h.)

Competency, consideration of witnesses, laws of search and seizure, court procedures, moot court exercises. *Prereq.* 94.393.

94.395 Fire Investigation and Arson 1 (3 q.h.)

A study of the elementary chemistry of combustion, including sources of ignition, fuels, the nature and behavior of gases and their toxicity. The combustion properties of nonsolid fuels as opposed to the combustion properties of solid fuels are considered. Consideration is also given to explosions associated with fires. Discussion of the socio-economic aspects of fire, including the pyromaniac and his or her physiological involvement.

94.396 Fire Investigation and Arson 2 (3 q.h.)

A concentrated approach is taken in dealing with the firebug and his or her sociological orientation. A discussion of carbon, hydrogen, and oxygen as major elements in all fires and the flameless ignition effect. Methods of fireproofing are also considered and references made to various types of building materials, as well as the role of pyrolysis. Fire patterns of structural fires and asphyxiation, along with the legal aspects of arson, are also considered. *Prereq.* 94.395.

94.397 Law Enforcement Fiscal Management (3 q.h.)

The various budgeting systems and their application to law enforcement organizations, including: the line-item budget, programmed budget, performance budget, and the planned programmed budget system; development of sound fiscal policy; appropriation of funds; tax base revenue systems; distribution of public monies; budget request, expenditures; and auditing procedures.

94.398 Massachusetts Criminal Law (3 q.h.)

A comprehensive study of Massachusetts criminal law and its application by law enforcement officers. Areas of study include common law, criminal statutes, annotated laws, criminal case law, Supreme Court decisions, and motor vehicle law.

94.399 Alcohol Problems in Law Enforcement (3 q.h.)

Acquaints the student with the current state of knowledge on society, culture, and drinking patterns; the variety of alcohol problems that confront peace officers; discussion of the range of solutions available.

94.400 Honors Program 1 (4 q.h.)

Prereq. Approval of the Dean.

94.401 Honors Program 2 (4 q.h.)

Prereq. 94.400.

94.402 Honors Program 3 (4 q.h.)

Prereq. 94.401.

94.403 Security Administration 1 (3 q.h.)

The historical, philosophical, and legal basis of security operations. A study of various security methods, utilizing personnel, equipment, and procedures.

94.404 Security Administration 2 (3 q.h.)

The organization, administration, and management of the security function; the systems approach to security operations, utilizing personnel and equipment resources. *Prereq.* 94.403.

94.405 Hazardous Materials (3 q.h.)

A survey of hazardous materials such as flammable fluids and gases, explosives, reactive materials, radioactive materials, and toxic substances. A discussion of methods of storage, handling, and transportation of such materials in accordance with pertinent regulations. Emphasis is on the control of hazardous materials emergencies.

94.406 Legal Aspects of Security Operations (3 q.h.)

The study of areas of law relevant to the security professional, including related aspects of criminal, civil, regulatory, and labor law.

94.407 Introduction to Government Security Programs (3 q.h.)

An introduction to various government security programs, including the Department of Defense, Industrial Security Program (DCASR), and the Nuclear Regulatory Commission Security Standards, and an analysis of the policy and legal basis for such programs.

94.408 Independent Studies 1 (3 q.h.)

Faculty-guided research in individually selected topics relating to the criminal justice system.

94.409 Independent Studies 2 (3 q.h.)

A continuation of faculty-guided research as described in 94.408. *Prereq.* 94.408.

94.410 Logical and Ethical Foundations of Decision Making 1 (3 q.h.)

An introduction to the basic principles of logical thought, aimed at showing ways of arriving at a well-founded conclusion, of criticizing and testing for errors in an argument, and of recognizing arguments presented by others. Focus is on real-life situations and practical decision making.

94.411 Logical and Ethical Foundations of Decision Making 2 (3 q.h.)

A study of basic theories concerning questions of morality and justice, especially as they apply to the con-

cerns of those in the criminal justice system, carrying over into an examination of various viewpoints concerning questions of punishment, e.g., why people are punished, and under what conditions a wrongdoer is to be excused from punishment. *Prereq.* 94.410.

94.412 Logical and Ethical Foundations of Decision Making 3 (3 q.h.)

Examination of a variety of areas that are important from moral and social points of view and of concern to the criminal justice system, such as victimless crimes, the nature and function of the law, and the nature of the professions. Real-life application of the questions in these fields will be stressed. *Prereq.* 94.411.

94.413 Seminar in Law Enforcement (Grantsmanship) 1 (3 q.h.)

Designed to familiarize the participants with the orderly sequence of organizational steps required in providing the institutional framework necessary for preparation and submission of applications to granting agencies. Major topics include: Omnibus Crime Control and Safe Streets Act of 1968; functions of the Law Enforcement Assistance Administration; grant application strategy, planning, and research.

94.414 Seminar in Law Enforcement (Grantsmanship) 2 (3 q.h.)

A continuation of 94.413, with an emphasis on evaluation, monitoring, and auditing grant programs. Strategies for different types of grants (HUD, EDA, SBA, CDBG, CETA) and private foundations and other non-profit organizations. *Prereq.* 94.413.

94.415 Domestic Violence (3 q.h.)

Central focus is on the effects of family abuse and violence. The interrelations of the police, the courts, and the human service worker with the family membership. Topics include the changing role of parents and children in today's world, battered wives, child abuse and neglect, sexual abuse, effects of divorce, alcohol and drugs, children's rights, government and private agencies concerned with neglect and abuse, case studies, and the laws and legal process involved in domestic violence. Open to students in law enforcement, criminal justice, and the helping professions associated with the course topic.

94.499 Field Work in Law Enforcement, Correctional Practices, and Security (6 q.h.)

An opportunity for students to become familiar with practice in their major field. To be arranged with department consultant or major adviser prior to registration. *Prereq.* Major in Law Enforcement, Correctional Practices, or Security, and completion of 18 q.h. in Law Enforcement, Correctional Practices, or Security.

94.500 Directed Study (In-Car Seminar) (3 q.h.)

Independent research work in a selected Criminal Justice/Law Enforcement area, limited to qualified students, with the approval of the University College Law Enforcement Program Director and verification of participation

in the In-Car Seminar project by the chief administrative officer or training director of the subscribing agency. *Prereq.* Participation in the In-Car Seminar Program and permission of the Law Enforcement Program Director of University College.

94.501 Human Behavioral Factors for Security Personnel 1 (3 q.h.)

This course is intended for those personnel in the Security role who intend to eventually become supervisors and administrators. It is intended to give them some insights into topics such as individual differences, motivation, job satisfaction, and attitudes of employees.

94.502 Human Behavioral Factors for Security Personnel 2 (3 q.h.)

The student will deal with interviews, evaluation of subordinates, some testing and personnel selection. It is expected that the student will have some knowledge of attitudes, morale, management, and leadership. This course will include some aspects of organizational development and relations with the general public. *Prereq.* 94.501

94.503 Human Behavioral Concepts and Tactics in Police Work 1 (3 q.h.)

Designed for police officers in all phases of police work, this course will focus on both the professional and personal life of the police officer. It is intended to cover practical and theoretical areas and to help the police officer deal with problems and issues both on the job and at home. Other topics will include: needs, drives, motivation, power and control of others, use of the gun, use of the uniform, "shoot to kill," use of vehicles, mixed patrols, supervision, unions, personality development, and discretion.

94.504 Human Behavioral Concepts and Tactics in Police Work 2 (3 q.h.)

Designed to examine issues of stress, anxiety, heart attack, drugs and alcohol, suicide, marriage, sexual inadequacy, sexual problems, and other factors that police officers face in their personal and professional life. *Prereq.* 94.503

Law Enforcement Intensive Courses

97.401 Criminal Law (Intensive) (6 q.h.)

Combination of 94.391 and 94.392.

97.402 Evidence and Court Procedure (Intensive) (6 q.h.)

Combination of 94.393 and 94.394.

97.403 Civil Law in Criminal Justice (Intensive) (6 q.h.)

Combination of 94.389 and 94.390.

97.404 Civil Liberties and the Police (Intensive) (6 q.h.)

Combination of 94.381 and 94.382.

97.405 Interviews and Interrogations (Intensive) (6 q.h.)

Combination of 94.308 and 94.309.

97.406 Traffic Safety and Control (Intensive) (6 q.h.)

Combination of 94.314 and 94.315.

97.407 Law Enforcement Identification and Records (Intensive) (6 q.h.)

Combination of 94.318 and 94.319.

97.408 Introduction to Criminalistics (Intensive) (6 q.h.)

Combination of 94.325 and 94.326.

97.409 Social Deviance (Intensive) (6 q.h.)

Combination of 94.328 and 94.329.

97.410 Law Enforcement Management and Planning (Intensive) (6 q.h.)

Combination of 94.343 and 94.344.

97.411 The Patrol Function (Intensive) (6 q.h.)

Combination of 94.323 and 94.324.

97.412 Criminal Investigation and Case Preparation (Intensive) (6 q.h.)

Combination of 94.304 and 94.305.

97.413 Criminology (Intensive) (6 q.h.)

Combination of 94.338 and 94.339.

97.414 Treatment of Offenders (Intensive) (6 q.h.)

Combination of 94.330 and 94.331.

97.415 Probation and Parole Practices (Intensive) (6 q.h.)

Combination of 94.341 and 94.342.

97.416 Fire Investigation and Arson (Intensive) (6 q.h.)

Combination of 94.395 and 94.396.

97.417 Advanced Correctional Practices (Intensive) (6 q.h.)

Combination of 94.311 and 94.312.

97.418 Correctional Administration (Intensive) (6 q.h.)

Combination of 94.332 and 94.333.

97.419 Law Enforcement Mathematics (Intensive) (6 q.h.)

Combination of 94.361 and 94.362.

97.421 Man, Law, and Society (Intensive) (6 q.h.)

Combination of 94.371 and 94.372.

97.422 Administration of Justice (Intensive) (6 q.h.)

Combination of 94.387 and 94.388.

97.423 Logical and Ethical Foundations of Decision Making (Intensive) (9 q.h.)

Combination of 94.410, 94.411, and 94.412.

97.424 Physical Security (Intensive) (6 q.h.)

Combination of 94.352 and 94.353.

97.425 Security Administration (Intensive) (6 q.h.)

Combination of 94.403 and 94.404.

97.426 Human Behavioral Factors for Security Personnel (Intensive) (6 q.h.)

Combination of 94.501 and 94.502

97.427 Human Behavioral Concepts and Tactics in Police Work (Intensive) (6 q.h.)

Combination of 94.503 and 94.504.

Faculty

- Ruth M. Aaron, M.S.
Health Professions
St. Elizabeth's Hospital
- Francis Abbate, B.S.
Law Enforcement
Westwood Police Department
- Samy A. Abdel-Baky, M.S.
Chemistry
Northeastern University
- Herbert Abrams, M.L.*
Law Enforcement
Superior Court of Massachusetts
- Michael J. Abruzzese, M.B.A.
Information Systems
St. Elizabeth's Hospital
- Henry Adleman, B.S.*
Information Systems
Digital Equipment Corp.
- John M. Aflague, R.N., B.S.
Health Professions
John P. Agnew, Ph.D.*
History
Pine Manor College
- Paul D. Ahern, M.B.A.
Accounting
Boston Edison
- Thomas J. Ahern, Jr., J.D.*
Law
Silver and Ahern
- H. David Ahlberg, Ph.D.*
Biology
American International College
- Joseph Aieta III, M.A.*
History
Lasell Junior College
- Nasreen Akanda, M.A.
Economics
Northeastern University
- Kariman I. Allam, B.S.
Chemistry
Northeastern University
- Gary L. Alles, B.S.
Information Systems
Digital Equipment Corp.
- Israel Aluf, Ph.D.
Modern Language
Northeastern University
- Harold E. Ameral, B.S.
Law Enforcement
State Police Academy
- Richard J. Amorosi, B.F.A.
English
Cardinal Spellman High School
- Charles S. Amorosino, Jr., M.A.
Health Professions
Massachusetts Medical Soc.
- Craig A. Andersen, B.S.
Massachusetts Medical Soc.
Northeastern University
- Harry L. Anderson, M.A.
English
Mansfield High School
- Paul G. Anderson, B.S.*
Art
Paul G. Anderson, Artist
- R. Wayne Anderson, Ph.D.
History
Northeastern University
- Joseph F. Angeramo, Esq., LL.B.
Finance
General Motors Accept. Corp.
- Robert B. Angus, B.S.
Information Systems
GTE/Sylvania
- Stanley S. Antoniotti, M.A.*
Economics
Bridgewater State College
- Robert F. Anzenberger, B.S.
Personnel and Industrial Rel
Camelot Industries Corp.
- Robert J. Anzenberger, M.A.
Personnel and Industrial Rel
Hills Dept. Stores
- Nathan C. Apatow, M.B.A.
Accounting
Town of Eastham
- John J. Arcari, M.B.A.
Accounting
LTX Corporation
- Joan L. Arches, M.S.
Anthropology/Sociology
Lasell Junior College
- Joseph T. Arcidiacono, B.S.
Information Systems
Digital Equipment Corp.
- Edward A. Arees, Ph.D.
Psychology
Northeastern University
- Stephen F. Armstrong, Sr., M.B.A.*
Purchasing
Ortho Diagnostic Systems, Inc.
- Steven A. Aronson, B.S.
Information Systems
The Gillette Company
- Emily Atkinson, M.B.A.
Women's Career Program
Data General Corp.
- Meredith O. Atkinson, M.A.
English
Saul H. Auslander, M.B.A.
- Finance*
Financial Corp. of America
- Jason M. Avergun, M.B.A.*
Marketing
Borg-Warner Corp.
- Warren F. Averill, M.S.*
Chemistry
Corning Glass Works
- Paula L. Aymer, M.A.
Anthropology/Sociology
Northeastern University
- Augustine A. Ayree, M.A.
Anthropology/Sociology
Boston University
- Kenneth J. Ayube, B.S.
Health Professions
Northeastern University
- David L. Bachrach, Ed.D.*
Psychology
Boston VA Medical Center
- Martin J. Badoian, M.A.
Mathematics
Canton High School
- Anthony J. Bajdek, M.A.*
History
Northeastern University
- Dorothy J. Bales, M.A.
Music
Peter S. Baletsa, M.S.
- Biology*
Lynn Public School System
- David B. Balise, M.Ph.*
Law Enforcement
McLean Hospital
- Kenneth W. Ballou, M.A.
Management
Waters Business Systems, Inc.
- David M. Banash, J.D.
Law
Hollingsworth & Pappas
- Frances M. Bancroft, B.A.
English
Hewlett-Packard
- Louis E. Banderet, Ph.D.
Psychology
U.S. Army Rsch. Inst. Envir. Med.
- John J. Baranofsky, M.S.*
Management
Raytheon Co.
- Antonio Barbagallo, M.A.
Modern Language
Salem High School
- David L. Barbero, M.F.A.*
Art
Lasell Junior College
- David R. Barkmeier, Ph.D.
Psychology
Northeastern University
- Raymond S. Barnstone, M.B.A.*
Finance
Itel Corp.
- Marsha E. Baron-Berg, M.A.
Anthropology/Sociology
Fin. Report Systems, Inc.
- Patricia Jean Barry, M.P.A.
Mathematics
Saugus High School
- Scott P. Bartis, B.A.
Psychology
Northeastern University
- Bernard N. Basch, M.B.A.*
Information Systems
F W Faxon Co.
- Kathryn M. Battillo, M.S.
Library Science
Simmons College
- Anthony Beadle, B.A.
Music
Alan J. Beauchamp, M.B.A.
- Accounting*
Computervision Corp.
- Nancy V. Becker, M.Ed.
American Sign Language
Northeastern University
- Judith E. Bedford, M.A.
Music
Stanley A. Beecoff, M.B.A.*
- Management*
BLH Electronics
- Roger Beer, M.S.
Information Systems
Digital Equipment Corp.
- Richard E. Belanger, B.S.*
Management
Honeywell Info. Systems
- Diane M. Bellavance, M.A.
Marketing
D. Bellavance, Agency
- Barbara A. Belmont, B.A.
Psychology
Northeastern University
- Ralph C. Belmonte, Ed.D.
Speech
Revere Public Schools
- Barbara A. Beltrand, M.A.
Accounting
Goodmeasure, Inc.
- Lisa R. Bender, Ph.D.
Therapeutic Recreation
Digital Equipment Corp.
- Richard F. Benedetto, M.A.
Management
Gerard Construction Co.
- Carole G. Bennett, M.Ed.
Health Professions
Mt. Auburn Hospital
- Paula Bennett, Ph.D.*
English

- Maria F. Benotti, M.A.
Music
N.E. Conservatory Extension
- Henry P. Bernardi, M.A.
Marketing
Bruce O. Bernstein, M.A.
Accounting
U.S. Treasury
- Samuel J. Bernstein, Ph.D.
English
Northeastern University
- Henry M. J. Biagi, M.A.
Management
City of Somerville
- Linda Biggs, M.B.A.
Information Systems
Raytheon Co.
- Maryann Billington, M.B.A.
Women's Career Program
Northeastern University
- Dennis J. Bird, M.S.
Biology
Tufts University
- Samuel S. Bishop, M.F.A.*
Art
Northeastern University
- Charles K. Black, M.B.A.
Accounting
Lewcote Chem. & Plastics Corp.
- Carl Blackman, B.S.*
Accounting
Carl Blackman & Co.
- Eugene J. Blackman, M.A.*
Drama
Northeastern University
- Charmarie J. Blaisdell, Ph.D.
History
Northeastern University
- Carl R. Blake, M.B.A.
Accounting
Commonwealth of Mass.
- Clifford F. Blake, B.A.
Health Professions
Medicus Corporation
- Robert J. Bianchi, Ph.D.*
English
Northeastern University
- Thomas W. Blaney, M.S.
Information Systems
Reading High School
- Theodore Blank, Ed.D.
Health Professions
Mass. Dept. of Public Health
- Carolyn L. Blitch, M.A.*
Anthropology/Sociology
Northeastern University
- C. Raymond Block, B.S.*
Accounting
C. Raymond Block Co.
- Alan H. Blume, B.S.
Political Science
North Shore Assoc. for Retarded
- Ellen M. Blumenstiel, M.D.
Health Professions
Northeastern University
- Naomi N. Bock, M.D.
Health Professions
Boston VA Medical Center
- Stanley I. Bogdan, B.S.
Law Enforcement
Boston Police Department
- Fletcher S. Boig, M.Ed.*
Chemistry
Retired
- Andre Bolaffi, Ph.D.
Management
Bolaffi International, Ltd.
- Robert W. Bolster, M.Ed.*
Law Enforcement
Sheriff's Office
- Vincent C. Borman, M.B.A.*
Transportation
Raytheon Co.
- Joel J. B. Bornstein, M.S.
Economics
Massport
- Charles R. Botticelli, Ph.D.
Biology
GTE Laboratories
- Guy E. Bottiglio, M.S.
Information Systems
Self-Employed
- Theodore R. Bousquet, B.S.*
Information Systems
Honeywell
- John F. Bowes, Jr., M.B.A.*
Information Systems
MBTA
- George S. Bowling, Ed.D.*
Personnel and Industrial Rel.
Dept. of Health and Human Services
- Patricia E. Boyce, M.A.
Anthropology/Sociology
Northeastern University
- Richard W. Boyden, B.S.
Information Systems
LFE Corporation
- Charles F. Boyer, Ph.D.
Health Professions
Woburn High School
- Catherine M. Boyle, M.P.H.
Health Professions
Mass. General Hospital
- Gerald Bracco, B.S.
Management
Self-Employed
- Alan Bradshaw, M.S.*
Mathematics
Chelmsford School Dept.
- John H. Brady, M.A.
Psychology
Northeastern University
- Patrick J. Brady, B.S.
Law Enforcement
Boston Police Department
- Thomas P. Brady, Jr., M.B.A.
Accounting
Rowe and Brady
- William F. Brady, Jr., M.B.A.
Management
Robert H. Davidson & Assoc.
- Norman Bram, M.S.
Information Systems
Avco Everett Research Lab.
- Eugene G. Branca, M.S.*
Mathematics
Jason Brandt, M.A.
- Psychology*
Boston University
- Barbara Reid Brathwaite, M.Ed.
Personnel and Industrial Rel.
Tufts University
- Raymond W. Brennan, M.S.*
Law Enforcement
Mass. Correctional Inst.
- David C. Breslin, M.B.A.
Finance
David L. Brett, M.S.
- Information Systems*
Reading Memorial High School
- James C. Brierley, Jr., M.B.A.
Accounting
Digital Equipment Corp.
- Edward J. Brigman, M.A.
Economics
Northeastern University
- Stanley J. Britton, M.B.A.*
Finance
Mass. Turnpike Authority
- William J. Brocaar, M.B.A.
Information Systems
Anderson Power Products, Inc.
- David L. Brody, B.S.*
Law Enforcement
Boston Police Department
- Barbara S. Bromfield, M.S.
Therapeutic Recreation
New England Sinai Hospital
- George M. Brooker, M.B.A.*
Economics
Dean Junior College
- William K. Brothie, M.Ed.
Chemistry
Belmont High School
- Gerald R. Brown, M.S.*
Law Enforcement
Plymouth Superior Court
- Ann S. Broyer, B.A.
Women's Career Program
Raytheon Co.
- Gordon L. Brumm, Ph.D.*
Philosophy/Religion
Eugene E. Bucco, M.B.A.
- Accounting*
Astra Pharmaceutical
- Leo F. Buckley, Jr., M.B.A.
Accounting
Dept. of Social Services
- Michael L. Buckley, M.B.A.
Accounting
Beth Israel Hospital
- Patricia Budd, M.Ed.
Women's Career Program
Digital Equipment Corp.
- Anthony A. Buglio, M.S.*
Speech
Richard H. Bullock, Ph.D.
- English*
Northeastern University
- Bruce Bunten, B.S.*
Personnel and Industrial Rel.
Stone & Webster Eng. Corp.
- Edward L. Burke, J.D.
Transportation
Commonwealth of Mass.
- Robert K. Burke, M.B.A.
Information Systems
Commercial Union Ins. Co.
- Alfred C. Burmeister, M.B.A.
Information Systems
Digital Equipment Corp.
- Charles F. Burt, M.B.A.*
Accounting
H. J. Stabile & Son, Inc.
- Jack S. Bushinsky, M.B.A.
Accounting
Zayre Corp.
- Nelson M. Butters, Ph.D.*
Psychology
Boston VA Hospital
- Robert T. Cadigan, Ph.D.
Health Professions
Mass. Dept. of Public Health
- Edward G. Cahaly, M.B.A.
Industrial Management
Foxboro Company
- Conrad P. Caligaris, Ph.D.*
Economics
Northeastern University
- Mark S. Callahan, M.A.
Political Science
Bentley College
- Harold J. Callanan, Ph.D.
History
Northeastern University
- William A. Calore, Ed.D.
Management
Rindge Latin School
- Charles Calusdian, M.B.A.
Industrial Management
Raytheon Co.
- David S. Calverley, Ph.D.*
Psychology
Dacal, Ltd.
- Frank R. Campagnoni, M.A.
Psychology
Northeastern University
- Dana B. Campbell, M.B.A.
Accounting
Digital Equipment Corp.
- Ballard C. Campbell, Jr., Ph.D.
History
Northeastern University
- James A. Canino, M.A.
Anthropology/Sociology
Northeastern University

- Edgar D. Canty, M.S.*
Mathematics
 Tufts University
- Enrico C. Cappucci, B.S.
Law Enforcement
 Shirley Police Dept.
- Brian R. Caputo, M.B.A.*
Management Sciences
 Raytheon Co.
- Donald A. Carbone, M.Ed.
Accounting
 Commonwealth of Mass.
- Ralph A. Cardarelli, Jr., M.S.
Industrial Management
 Digital Equipment Corp.
- Jeffrey J. Carlson, M.B.A.
Accounting
 Self-Employed
- Christina Carpenter, M.B.A.
Accounting
 McCormack & Dodge
- Charles J. Carr, M.B.A.*
Accounting
 The New Can Co., Inc.
- Janet H. Carr, M.A.
English
- John M. Carr, B.S.
Earth Science
 Museum of Science
- William F. Carr, LL.B.
Law
 Puopolo & Carr
- Philip F. Carrigan, Jr., M.A.
Psychology
 Northeastern University
- Patrick R. Carroll, Esq., J.D.*
Health Professions
 Mass. Hospital Assoc.
- William S. Carroll, Esq., J.D.
Health Professions
 National Medical Care, Inc.
- Barbara A. Carson, M.A.
Anthropology/Sociology
 Northeastern University
- Norman J. Cartmill, M.B.A.*
Management
 Revere Copper & Brass, Inc.
- Arthur F. Casavant, M.B.A.
Purchasing
 Raytheon Co.
- Dennis F. Casey, B.S.
Law Enforcement
 Casey's Invest. Agency, Inc.
- Robert W. Casey, M.Ed.
Speech
 Burlington High School
- Margaret P. Casper, Ph.D.
Mathematics
 King Philip Regional Sch. Dist.
- Christopher L. Cass, M.A.
Anthropology/Sociology
 Badger America, Inc.
- Sharron G. Cassavant, Ph.D.
English
- Christopher J. Cassidy, M.S.*
Information Systems
 Data General Corp.
- Richard H. Castle-Walsh, M.B.A.
Women's Career Program
 Bethlehem Steel Corp.
- Stephanie L. Catalan, M.A.*
Anthropology/Sociology
 Massasoit Community College
- Dianne M. Caughey, M.A.
Economics
 Northeastern University
- Donna M. Chadwick, M.S.
Therapeutic Recreation
 Emmanuel College
- Ruth B. Chamberlain, M.A.
Library Science
 Plymouth Public Library
- Arthur P. Chaman, M.B.A.*
Marketing
 Champion Associates, Inc.
- Kenneth Chernack, M.B.A.
Information Systems
 Digital Equipment Corp.
- Jerry D. Cherrington, M.A.
Philosophy/Religion
 New England Life
- Catherine Chiang, B.A.
Economics
 Northeastern University
- John T. Chirban, Ph.D.
Psychology
 Harvard Univ. & Hellenic Coll.
- John A. Chmielinski, M.Ed.*
Law Enforcement
 Dept. of Corrections
- Warren W. Church, M.S.
Health Professions
 U.S. FDA
- Anthony Cicerone, M.A.
Economics
 Plymouth Carver Int. School
- David J. Ciliberto, Ph.D.
Anthropology/Sociology
 Northeastern University
- William J. Cintolo, J.D.
Law Enforcement
 Attorney-at-Law
- Joseph D. Clancy, J.D.
Law Enforcement
 District Court of Natick
- Thomas H. Clark, M.A.
Reading
 Northeastern University
- Richard W. Clayton, Jr., M.Ed.
English
 Medway High School
- Paul Clemente, Jr., M.S.
Accounting
 Boston University
- William M. Cloran, J.D.*
Law Enforcement
 Joye Capeless Kilroy McNulty
- Gerald F. Cody, B.A.
Marketing
 Smith Barney Harris Upham
- Cathy Cogen, B.A.
American Sign Language
 Northeastern University
- William G. Coggan, Ph.D.*
Personnel and Industrial Rel.
 Massasoit Community College
- Edward S. Cohen, M.A.*
Marketing
 Director of Client Services
- Leila R. Cohen, Ph.D.
Psychology
 Northeastern University
- Marcia B. Cohen, M.S.W.
Social Welfare
 Northeastern University
- Michael J. Cohen, B.S.
Chemistry
 Northeastern University
- Robert F. Cohen, B.S.
Accounting
 Self-Employed
- Robert L. Cohen, M.S.
Information Systems
- David M. Coit, M.B.A.
Finance
 Maine Capital Corp.
- Julio A. Colavita, B.S.
Information Systems
 Raytheon Co.
- Jaimee W. Colbert, M.A.
English
 Alexander M. Colby, M.B.A.
- Alexander M. Colby, M.B.A.
Finance
 State Street Bank & Trust
- Annalee Collins, R.R.A., B.S.*
Health Professions
 Northeastern University
- Eleanor J. Collins, A.B.
Northeastern University
- William J. Collins, M.B.A.
Industrial Management
 Defense Contracts Admin.
- Richard J. Comings, M.A.*
History
 Northeastern University
- Viola S. Conaty, A.S.
Cyto Technology
 Northeastern University
- John J. Condon, Jr., M.B.A.
Accounting
 Avco Systems Division
- Paul C. Condon, M.B.A.
Marketing
 Amdax Corp.
- Elizabeth M. Congdon, M.A.
History
 Peabody School System
- Norman J. Conklin, B.S.*
Information Systems
 Honeywell Info. Systems
- Nigel A. Conliffe, B.S.
Information Systems
 Interactive Images
- James E. Conlin, M.B.A.
Management
 Personnel Fundamentals, Inc.
- Leonard M. Conlin, M.Ed.*
Mathematics
 Framingham North High School
- John J. Connelly, B.S.
Law Enforcement
 Mass. Trial Court
- William G. Connelly, B.S.
Law Enforcement
 Metropolitan Dist. Police
- Thomas F. Connerty, M.B.A.
Information Systems
 Prime Computer, Inc.
- James J. Connolly, M.B.A.
Accounting
 Public Schools
- Claire S. Connor, M.P.H.
Health Professions
 Northeastern University
- Mary T. Connor, B.S.
Health Professions
 Children's Hospital Med. Ctr.
- Joseph N. Connors, M.P.A.*
Political Science
 Northeastern University
- Louis E. Conrad, B.A.
Journalism
 Northeastern University
- Lindsay Cook, M.S.
Accounting
 Liberty Financial Services Co.
- Joyce M. Cooksey, M.Ed.
Chemistry
 No. Weymouth High School
- Harold F. Cooper, Ph.D.
Anthropology/Sociology
 W. Yarmouth Congregational Church
- Robert L. Cord, Ph.D.
Political Science
 Northeastern University
- Dyer Cornell, M.B.A.
Finance
 First National Bank
- Richard S. Corrente, M.B.A.*
Management
 Raytheon Co.
- Edward V. Cosgrove, Ph.D.
Biology
 Commonwealth of Mass.
- William H. Costello, Ph.D.
Psychology
 Dr. William H. Costello, Ph.D.
- James W. Cottom, M.A.
History
 Massasoit Community College
- David C. Coughlin, M.P.A.
Political Science
 Al Nellum and Associates

- Paul D. Coughlin, M.B.A.*
Finance
First National Bank
- Geoffrey R. Coulter, Ph.D.
Modern Language
Northeastern University
- Gregory R. Couture, B.A.
Political Science
Northeastern University
- Johnathan C. Covell, B.A.
Information Systems
Hills Dept. Store
- Thomas F. Coveney, M.B.A.*
Information Systems
Stone & Webster Eng. Corp.
- James M. Cox, M.Ed.*
Law Enforcement
Boston Police
- Wallace Coyle, Ph.D.
English
University of Massachusetts
- John E. Coyne, J.D.
Management
Self-Employed
- Ralph J. Candali, Ph.D.
History
N.E. Hist. Genealogical Society
- Carol L. Crane, M.Ed.
Women's Career Program
Mass. Higher Ed. Asst. Corp.
- Bryan D. Craven, B.S.
Information Systems
General Electric Co.
- Salvatore A. Crisafulli, M.B.A.*
Information Systems
Arthur D. Little
- Robert D. Crofts, M.A.
Economics
Salem State College
- Peter V. Crone, M.A.
Law Enforcement
Brockton Police Department
- John F. Cronin, Jr., M.B.A.*
Accounting
Raytheon Co.
- Joseph W. Cronin, B.S.
Management Sciences
Sanders Associates
- Hugh J. Crossland, M.B.A.*
Law
Crossland Aresty & Levin
- Brian C. Crowley, M.B.A.*
Accounting
Theta-J Corp.
- Dennis M. Crowley, J.D.
Law Enforcement
First Security Services
- John F. Cullen, J.D.*
Law Enforcement
John F. Cullen
- Joseph I. Cullen, M.Ed.
Law Enforcement
Dept. of Youth Service
- David M. Culver, Ph.D.*
History
Bridgewater State College
- Edmund Cuoco, B.A.
English
Lexicon, Inc.
- Helen M. Curley, M.A.
Law Enforcement
- Albert C. D'Amato, M.Ed.
English
Northeastern University
- Miriam F. D'Amato, M.A.
English
Professional Editorial Serv.
- Ralph A. D'Amelio, B.S.
Information Systems
Wang Laboratory
- Patricia Dacey, M.Ed.
Women's Career Program
Y.W.C.A.
- Arnold E. Daum, B.A.*
Marketing
Arnold E. Daum Co.
- Donna M. Davis, M.A.
History
ABT Associates
- Gerald L. Davis, Ph.D.
Health Professions
Northeastern University
- Richard J. Davis, M.A.*
Law Enforcement
Belmont School Dept.
- Willie J. Davis, J.D.*
Law Enforcement
Attorney-at-Law
- Peter U. Decenzo, B.S.
Mathematics
Ashland High School
- John C. Decker, M.B.A.
Personnel and Industrial Rel.
Harvard Trust Co.
- Victor G. Degruotola, M.S.
Health Professions
Brigham & Women's Hospital
- John R. Deitrick, M.A.*
English
Becker Junior College
- Richard P. Del Prete, Ed.D.
Anthropology/Sociology
Lasell Junior College
- Joyce Delorey, M.A.
Reading
Janice B. Delsesto, M.A.
- Dante J. DeMichaelis, J.D.*
Law Enforcement
Middlesex County D.A. Office
- Robert J. Dennehy, M.B.A.
Accounting
C.P.A.
- Mabel T. Denunzio, M.Ed.
Law Enforcement
- Arthur J. DePietro, M.S.
Law Enforcement
Juvenile Court
- Paul J. Derby, M.B.A.*
Information Systems
Honeywell
- Joseph B. DeRoche, M.F.A.*
English
Northeastern University
- Stephen R. Derosier, M.B.A.
Management
Northeastern University
- Harry G. DeSalvatore, M.S.
Therapeutic Recreation
N.E. Memorial Hospital
- Ernest P. Desimone, J.D.
Real Estate
Dept. of the Attorney General
- Richard K. Deveney, M.Ed.
Mathematics
Jamaica Plain High School
- James D. Devlin, B.S.
Marketing
- Jane E. Devoe, M.A.
Reading
- Brian S. Dextradeur, B.S.
Management Sciences
Polaroid Corp.
- Francis J. di Sabatino, M.A.
Chemistry
Quincy High School
- Melinda M. di Sessa, Ph.D.*
Philosophy/Religion
- Arthur F. Diette, Jr., B.S.
Law Enforcement
Lowell Police Dept.
- Jeffrey E. Diuglio, M.A.
English
E.L.S. Language Center
- Edward J. Dillon, M.B.A.*
Personnel and Industrial Rel.
Raytheon Co.
- Howard T. Dimmick, M.Ed.*
Earth Science
Town of Stoneham
- Robert F. Dincauze, M.B.A.
Management
Cantabrigian Publishing Corp.
- Ernest S. Dinisco, J.D.
Law Enforcement
U.S. Dept. of Justice
- Philip S. DiSalvio, M.Ed.
Health Professions
Harvard University
- Theodore Distaso, Jr., M.P.A.
Political Science
U.S. Govt. Dept. of Defense
- Rosemarie M. Dittmer, M.A.
English
- James E. Doan, Ph.D.
English
Chamberlayne Junior College
- Alan F. Dodd, Esq., J.D.
Political Science
- Alan F. Dodd, Esq.
Mathematics
- Edward Doherty, B.S.*
Law Enforcement
Boston Police Department
- Robert A. Dolan, M.Ed.*
Law Enforcement
Research Publishing Co.
- Mark Domaszewicz, M.S.E.E.*
Mathematics
Raytheon Co.
- Janice E. Donatelli, B.S.
Biology
Northeastern University
- Michael B. Donham, M.B.A.*
Personnel and Industrial Rel.
The Center House, Inc.
- Edward M. Donie, M.S.
Information Systems
Data General Corp.
- William J. Donnelly, Jr., B.S.
Law Enforcement
Registry of Motor Vehicles
- John A. Donovan, M.A.
Economics
Northeastern University
- Timothy R. Donovan, Ph.D.*
English
Northeastern University
- Marcia A. Dorey, M.S.
Library Science
Christ Church United
- Edward M. Dormady, B.A.
Information Systems
Hills Dept. Stores
- Michael C. Dorman, M.A.
Anthropology/Sociology
Northeastern University
- James W. Dottin, Jr., M.B.A.
Information Systems
- Nadine V. Dowling, M.B.A.
Personnel and Industrial Rel.
Northeastern University
- Nancy L. Dowling, M.Ed.
Reading
Northeastern University
- James F. Downey, Ph.D.
Management
Levinthal & Horwath
- Rose A. Doyon, M.A.*
English
- C. Paul Dredge, M.A.
Anthropology/Sociology
Northeastern University
- John Dreimanis, M.A.
Political Science
Northeastern University
- Joan F. Drexelius, Ph.D.
Speech
Northeastern University
- Claire M. Driscoll, M.A.
Mathematics
Northeastern University
- John P. Driscoll, Esq., J.D.
Real Estate
Self-Employed

- Richard E. Driscoll, J.D.*
Law Enforcement
R. E. Driscoll, Atty.-at-Law
Walter T. Driscoll, Jr., M.P.A.*
Law Enforcement
Sctuate Police Department
William T. Driscoll, M.B.A.
Finance
Foxboro Company
H. Alfred Droge, B.S.
Information Systems
Self-Employed
David C. Dronsick, M.A.*
Earth Science
Commonwealth of Mass.
Neil F. Duane, M.S.
English
Hewlett-Packard
Edward L. Dube, M.B.A.*
Management
ELD Associates
Ardyn E. Dubnow, M.B.A.*
Accounting
Northrop Corp.
Terrance J. Dugan, M.B.A.
Finance
Investors Bank and Trust Co.
Lance R. Dunham, A.S.
Health Professions
Brigham & Women's Hospital
Laura W. Dunn, M.A.
English
Edward A. Duprez, Jr., M.B.A.
Management
MASBO Corporation
Paul J. Duval, M.B.A.
Information Systems
State Exec. Off. Adm. & Finance
Barbara Dvorchak, M.A.
Reading
Judith T. Dwyer, M.A.
Psychology
Northeastern University
William C. Dwyer, M.B.A.
Management
Sherwood Lumber Corp.
Richard T. Dyro, Ed.D.
English
Carl W. Eastman, M.A.*
Speech
Northeastern University
Norman J. Ebsary, M.P.A.
Law Enforcement
Boston Police Department
William T. Edgett, M.A.*
Personnel and Industrial Rel.
Northeastern University
Maureen L. Edison, M.A.*
English
Lynn Hospital
Gary A. Edwards, M.A.
Accounting
U.S. Dept. of Labor
Harvey J. Edwards, Ph.D.
English
Council N.E. Econ. Action
Ralph W. Edwards, M.P.H.
Health Professions
Roxbury Dental & Med. Group
Richard K. Edwards, M.A.
Anthropology/Sociology
Northeastern University
Andrew E. Efstathiou, B.A.
Information Systems
Commonwealth of Mass.
Kathryn A. Efstathiou, B.A.
Information Systems
David M. Ehrmann, B.S.
Speech
Hanover High School
Robert L. Ehrmann, M.D.
Health Professions
Brigham and Women's Hospital
Hoda A. El Wakil, M.S.
Chemistry
Northeastern University
Mohamed El-Sayed, M.S.
Chemistry
Northeastern University
James H. Elgin, M.B.A.*
Information Systems
Digital Equipment Corp.
Stephen E. Elmont, A.S.
Management
Creative Gourmets, Ltd.
Louis J. Ennis, M.B.A.
Management
Brandeis University
J. Clive Enos, B.S.*
Personnel and Industrial Rel.
Herbert J. Eskot, M.A.
Economics
Northeastern University
Benedetto Fabrizi, Ph.D.
Modern Language
Northeastern University
Robert M. Fahey, M.Ed.
Information Systems
Commercial Union Assur. Co.
Michael V. Fair, M.S.W.
Law Enforcement
Mass. Dept. of Corrections
Sheryl L. Fairchild, B.S.
Therapeutic Recreation
Malden Hospital
Eugene F. Fallon, M.B.A.*
Finance
GenRad, Inc.
Edward J. Falvey, M.B.A.
Management
Massachusetts Companies, Inc.
Andrew C. Fantasia, M.B.A.
Accounting
Self-Employed C.P.A.
Daniel M. Fasulo, M.P.A.*
Law Enforcement
Haverhill Police Dept.
Abdul Fattah, M.S.
Economics
Northeastern University
Joanne Fattori, M.A.
English
Richard J. Faulstich, A.B.
Personnel and Industrial Rel.
Raytheon Co.
Irwin Feigelman, B.S.*
Accounting
U.S. Government
David Feinman, M.B.A.
Management Sciences
Independent Consultant
Mark Feldman, M.B.A.
Information Systems
The Gillette Company
James F. Ferreira, M.B.A.
Information Systems
MBTA
James J. Ferriter, M.B.A.
Health Professions
Carney Hospital
William A. Ferson, M.A.
Economics
U.S. Dept. of Labor
George W. Fiddler III, M.B.A.
Accounting
Avco
Stephen L. Fielding, M.A.
Anthropology/Sociology
Northeastern University
Barbara Ann P. Filo, Ph.D.*
History
Charles A. Findley, Ph.D.*
Speech
Francis X. Finigan, B.S.*
Earth Science
Winchester Public Schools
Joseph L. Finigan, M.Ed.
Mathematics
Rivers School
Albert J. Finney, Jr., B.S.*
Accounting
Raytheon Co.
Harold R. Fisher, J.D.
Information Systems
Data General Corp.
William H. Fisher, M.Ed.
Anthropology/Sociology
Northeastern University
Charles E. Fiske, C.A.G.S.
Law Enforcement
Currier Center
Edward A. Fitzgerald, M.A.
Political Science
Northeastern University
Leo J. Fitzgerald, M.B.A.*
Industrial Management
General Electric
Kevin T. Fitzpatrick, M.B.A.*
Finance
Boston Public Library
J. Joseph Fitzsimmons, M.B.A.
Management
Polaroid Corp.
Kathleen M. Flagg, M.B.A.
Women's Career Program
BayBanks Data Services, Inc.
Richard E. Flaherty, M.P.A.
Law Enforcement
Metropolitan District Police
Lyn B. Fleming, M.Ed.
Health Professions
Northeastern University
F. Garth Fletcher, A.S.
Information Systems
Fletcher Applied Science, Inc.
David E. Floreen, M.P.A.
Political Science
Massachusetts Bankers Assoc.
Eileen M. Flynn, B.S.
Health Professions
Mass. General Hospital
Leo M. Flynn, M.B.A.*
Real Estate
Leo Flynn R.E. & Appraising
Peter E. Flynn, J.D.
Real Estate
Dept. of Attorney General
William B. Flynn, Ph.D.
Psychology
Merrimack Valley College
Ellen F. Foley, M.A.
History
Suffolk University
Martin E. Foley, M.P.A.*
Law Enforcement
Mass. State Police
Robert E. Foley, M.B.A.
Accounting
Northeast Econ. Action Rsch.
Robert J. Forrest, Esq., J.D.
Accounting
Robert J. Forrest, P.C.
Armand L. Fortin, B.S.
Purchasing
Honeywell
James Foss, Jr., LL.B.
Personnel and Industrial Rel.
Fed. Mediation & Concil. Serv.
Douglas G. Foster, M.Ed.*
Earth Science
City of Boston
Gale P. Foster, B.S.*
Marketing
Samson Ocean Systems, Inc.
Robert M. Fox, M.B.A.*
Marketing
Gerber Electronics
Walter Foxtree, M.A.T.*
Art
University of Massachusetts
Laura L. Frader, Ph.D.
History
Northeastern University
Thomas B. Francis, Jr., M.P.A.
Personnel and Industrial Rel.
City of Boston

- Stephen A. Fraser, B.A.
Information Systems
Honeywell Information Systems
- Howard H. Freedman, M.S.*
Accounting
Raytheon Co.
- Peggy L. Freeman, B.S.
Health Professions
Kennedy Memorial Hospital
- Melvin W. Friedman, M.B.A.*
Management
M. W. Friedman Association
- Daniel C. Fric, M.A.
History
Wayland High School
- Martha R. Fuller, M.S.
English
- Norbert L. Fullington, Ph.D.
History
Northeastern University
- Vincent J. Furlong, M.A.
Industrial Management
U.S. Government
- James I. Gabbe, M.S.
U.S. Government
- Neil A. Gaeta, Ph.D.
Health Professions
Food & Drug Admin.
- Brian A. Gagne, M.B.A.
Real Estate
City Corp. Real Estate
- W. Arthur Gagne, Jr., M.B.A.*
Management
Worcester Art Museum
- Kenneth W. Gagnon, B.S.
Law Enforcement
Mass. Dept. of Public Safety
- John M. Gale, M.B.A.
Health Professions
University Hospital
- Esther M. Gallagher, D.M.D.
Health Professions
Tufts University
- Richard R. Gallagher, B.A.
Information Systems
- M. Jane Gallahue, MPH
Health Professions
Northeastern University
- Arthur R. Gallerani, Jr., M.B.A.
Management
Middlesex Community College
- Frank T. Gallo, Ph.D.
Health Professions
Gallo Associates, Inc.
- Gerald V. Galuardi, B.A.
Health Professions
New England Deaconess Hosp.
- A. Newell Garden, B.S.
Journalism
Raytheon Co.
- Rawle W. Garner, M.B.A.
Law Enforcement
New England Business Corp.
- Donald E. Garratt, M.B.A.
Real Estate
Wakfield Savings Bank
- Ingrid Garriga, M.A.
Anthropology/Sociology
La Alianza Hispana, Inc.
- John D. Gavin, M.S.
Law Enforcement
Waltham District Court
- Stanley S. Gawiinski, B.S.*
Law Enforcement
Boston Police Department
- Paul C. Gay, J.D.*
Law
Barron & Stadfeld
- Augustus N. Gbosi, M.A.
Economics
Northeastern University
- Jonathan Gbur, M.B.A.
Transportation
Boston & Maine Corp.
- Gerard J. Geant, M.B.A.
Real Estate
Hannaford Bros. Company
- Sandra E. Geer, M.E.D.
Psychology
Univ. of Mass., Boston
- Howard J. Geller, C.A.G.S.
Health Professions
Framingham Union Hospital
- Samuel S. Geller, M.B.A.
Accounting
McCormack & Dodge Corp.
- John R. Geraghty, M.B.A.*
Management
Retired
- Anne M. Germain, Ph.D.
Information Systems
Hills Dept. Stores
- Burton W. Gernig, J.D.
Law Enforcement
Community Health
- David M. Ghazil, M.B.A.
Personnel and Industrial Rel.
Honeywell
- Peter F. Gibbs, M.B.A.
Transportation
Peter F. Gibbs & Associates
- Adrian T. Gilbert, B.S.
Biology
Northeastern University
- Emanuel M. Gilbert, B.S.
Marketing
E. M. Gilbert Assoc.
- Edwin S. Giles, Jr., B.S.*
Information Systems
Massachusetts Teachers Assoc.
- Ruth Gilleran, M.B.A.
Accounting
The Gillette Company
- William J. Gillespie, Ph.D.
Health Professions
Northeastern University
- Gregory Gillis, Ph.D.
Biology
Bunker Hill Community College
- Ronald E. Gittens, B.A.
Anthropology/Sociology
Northeastern University
- Alan B. Gladstone, B.S.
Accounting
Alan Gladstone, C.P.A.
- Phyllis S. Glick, D.B.A.
Political Science
DFH/DFHS
- L. James Glinos, M.Ed.*
Personnel and Industrial Rel.
Glinos Associates
- Ronald C. Glover, J.D.
Personnel and Industrial Rel.
U.S. Dept. of Labor
- Randolph P. Goetze, M.Ed.
Speech
- Stephen J. Golburgh, Ed.D.
Psychology
Self-Employed
- Leonard B. Goldberg, B.A.
Biology
Northeastern University
- Linda S. Goldberg, C.A.G.S.
English
Northeastern University
- Robert L. Goldberg, M.B.A.*
Management
John Hancock Dist., Inc.
- Daniel Golden, Ph.D.
English
Northeastern University
- Frederick T. Golder, Esq., LL.M.*
Personnel and Industrial Rel.
Law Offices/Frederick Golder
- Stan Goldman, J.D.*
Political Science
Mass. Dept. of Mental Health
- Harold M. Goldstein, Ph.D.
Economics
Northeastern University
- Howard I. Goldstein, J.D.
Law
Self-Employed
- M. Alvin Goldstein, A.B.*
Information Systems
Informatics, Inc.
- Robert J. Goldstein, M.A.
Anthropology/Sociology
Northeastern University
- Roberta L. Golick, J.D.
Personnel and Industrial Rel.
State Board Concil. & Arb.
- Lorraine B. Goodall, M.S.
Health Professions
Emerson Hospital
- Judith R. Goodman, M.A.*
English
- Leon M. Goodman, M.B.A.*
Personnel and Industrial Rel.
Leon Goodman Associates
- Robert S. Goodman, M.A.
Personnel and Industrial Rel.
Evans Products Co.
- Frederick R. Goodridge, M.B.A.
Transportation
Frederick Goodridge Assoc.
- Stephen Goodyear, M.A.
Modern Language
Hull Public Schools
- Kuttikkunumma Gopalan, M.B.A.
Economics
Northeastern University
- Bernard L. Gordon, M.S.*
Earth Science
Northeastern University
- Daniel D. Gordon, M.A.*
Economics
Salem State College
- S. Peter Gorshel, LL.B.
Real Estate
Self-Employed
- Mary Jane Gorton, M.Ed.*
Art
Babson College
- Leslie C. Gosule, B.S.
Accounting
C.P.A.
- Daniel Z. Gould, M.B.A.
Industrial Management
Instrumentation Labs
- David F. Grace, M.A.*
English
Lasell Junior College
- Daniel A. Grady, M.B.A.*
Accounting
Wm. Underwood
- William E. Grady, B.S.*
Industrial Management
Courier Corporation
- Patrick Grant, Jr., M.H.A.
Health Professions
Self-Employed
- Leon S. Graubard, M.A.*
Economics
Worcester Polytechnic Inst.
- Joseph L. Greaney, M.B.A.
Accounting
- Nancie S. Green, M.S.
Anthropology/Sociology
Northeastern University
- Richard T. Green, Ed.D.
Therapeutic Recreation
Masconomet Regional High School
- Stephen S. Greene, B.S.
Masconomet Regional High School
Northeastern University
- Herbert J. Greenwald, Ph.D.
Psychology
Bridgewater State College
- Nina L. Greenwald, Ph.D.
Psychology
Bridgewater State College
- John T. Gregg, B.A.
Real Estate
Beal & Company

- Kristo A. Gregory, M.B.A.*
Finance
L. F. Rothschild, Unterberg, Towbin
- Gerald R. Griffin, Ph.D.*
English
Northeastern University
- John L. Griffith, B.S.*
Management
State Dept. of Environmental Mgt.
- Joseph Grimaldi, M.A.*
History
First National Bank
- Duane L. Grimes, Ph.D.*
Political Science
Northeastern University
- Donna P. Grosjean, B.S.
Biology
Brigham & Women's Hospital
- Martin L. Gross, M.S.E.E.
Marketing
Dynamic Measurement Corp.
- Forest W. Grumney, M.B.A.*
Mathematics
Com/Energy
- Sidra Gruss, M.A.
Therapeutic Recreation
- John J. Guarino, B.A.
Biology
Northeastern University
- Ronald E. Guittarr, B.S.
Personnel and Industrial Rel.
Raytheon Co.
- John R. Gustafson, M.B.A.
Accounting
John Hancock Life Ins. Co.
- Reginald W. Hache, M.A.
Music
Northeastern University
- Edward A. Hacker, Ph.D.*
Philosophy/Religion
Northeastern University
- Richard S. Haddad, M.B.A.
Accounting
Wang Laboratories
- Joanna Hadjicostandi, B.A.
Anthropology/Sociology
Northeastern University
- William T. Hadley, B.S.
Marketing
The Hadley Company
- Martin H. Halabian, J.D.*
History
Nat. Asoc. Armenian Studs. Rsch.
- John P. Haley, C.A.G.S.
Information Systems
Revere High School
- Alice H. Hall, M.Ed.
Reading
Northeastern University
- Barry D. Hall, A.S.
Health Professions
B.U. Medical Center Univ. Hosp.
- John F. Halloran, B.A.
Marketing
Internal Revenue Service
- Paul M. Halloran, B.S.*
Information Systems
Raytheon Co.
- Michael C. Halpern, B.S.
Information Systems
Commercial Union
- Donald J. Halpin, M.B.A.*
Finance
Winchester Fin. Mgt. Corp.
- Isadore Halzel, M.B.A.*
Management
Charles Stark Draper Labs
- Jacalyn S. Hamada, B.A.*
Therapeutic Recreation
Boston University
- Curtis A. Hammar, B.A.
Music
Worcester Telegram
- Paula J. Hammett, B.S.
Health Professions
Framingham Union Hospital
- Clarence D. Hammond, Ph.D.
Psychology
Northeastern University
- Susan M. Hammond, B.S.
Accounting
Etra Incorporated
- William F. Hancock, Jr., M.B.A.*
Finance
Digital Equipment Corp.
- Francis R. Hankard, M.A.*
Law Enforcement
Mass. Dept. of Public Safety
- William L. Hannah, Ed.D.
Psychology
Suffolk University
- Robert F. Hannon, M.B.A.
Economics
Sandwich High School
- Joseph J. Hansen, M.B.A.*
Mathematics
Raytheon Co.
- Norman E. Hansen, M.B.A.*
Marketing
D. W. Adams
- Ronald M. Hansen, Ph.D.
Psychology
Children's Hospital Med. Center
- Gerald I. Harel, Ph.D.
Economics
Mass. College of Pharmacy
- J. Steven Hargrave, B.S.
Information Systems
Digital Equipment Corp.
- Richard A. Hargreaves, M.A.
Mathematics
Westwood High School
- Catherine E. Hargrove, M.S.W.
Anthropology/Sociology
Northeastern University
- Priscilla G. Harmel, M.Ed.
Drama
- David J. Harrigan, M.B.A.*
Management Sciences
D. J. Harrigan Associates
- Charles W. Harrington, Jr., Ph.D.
Economics
Northeastern University
- Francis A. Harris, M.A.
Economics
Northeastern University
- Martina N. Harris, R.T., B.S.
Health Professions
Children's Hospital Medical Center
- Ruth Ann M. Harris, Ph.D.*
History
Northeastern University
- Susan H. Harris-Sharples, M.Ed.
Reading
Harvard University
- Thomas M. Hart, M.S.
Accounting
U.S. Treasury
- Harold Harutunian, Ph.D.*
Mathematics
Salem State College
- Iorgos Hatzicostantin, M.S.
English
Northeastern University
- Eva C. Havas, Ph.D.
Anthropology/Sociology
Northeastern University
- Donald R. Hayden, B.S.*
Information Systems
Digital Equipment Corp.
- David W. Hayes, Esq., LL.M.
Political Science
The Seiler Corporation
- Kathleen H. Hayes, M.Ed.
Women's Career Program
Northeastern University
- Marie J. Hayes, M.A.
Psychology
Northeastern University
- Robert T. Heald, M.B.A.
Accounting
Heald Hoffmeister and Co.
- R. Heanue, B.A.
Transportation
Heanue Management Services
- James L. Hearn, M.B.A.
Health Professions
Eastern Mass PSRO
- Warren K. Heckman, M.A.*
Management
W. K. Heckman Associates, Inc.
- Barbara A. Heffner, M.S.
English
McCormack and Dodge
- F. Timothy Hegarty, Jr., J.D.
Real Estate
Commonwealth of Mass.
- Robert J. Hehre, D.B.A.*
Finance
Northeastern University
- Barbara J. Hein, M.S.W.
Therapeutic Recreation
Digital Equipment Corp.
- Louise H. Hekimian, M.B.A.
Management
Thomas R. Henderson, M.B.A.
- Accounting
Polaroid Corp.
- Robin M. Hendrich, Ed.D.*
Music
Northeastern University
- E. Dianne Hennessy, M.Ed.
Personnel and Industrial Rel.
GTE
- George S. Hennessy, M.B.A.
Marketing
AMDAX
- Richard C. Herlihy, B.S.
Information Systems
American Mutual Liability Co.
- Gerald H. Herman, M.A.*
History
Northeastern University
- George M. Herrick, M.B.A.*
Finance
John E. Cain Co.
- Matthew L. Herz, Ph.D.
Finance
U.S.A. Natick R&D Laboratories
- Max E. Hess, M.A.*
Anthropology/Sociology
Northeastern University
- George F. Hickey, Jr., M.S.*
Library Science
Town of Billerica School Dept.
- Michael J. Hicks, M.B.A.
Information Systems
Beverly Hospital
- Robert L. Hicks, M.B.A.
Finance
Bentley College
- Chester W. Higgins, M.B.A.*
Management
Peter Higgins, M.B.A.*
- Accounting
Xtrax Corp.
- Arthur P. Hill, M.B.A.*
Marketing
Bentley College
- Lloyd H. Hill, J.D.
Personnel and Industrial Rel.
City of Quincy
- Stephen A. Hiltz, M.A.
History
Northeastern University
- James R. Hindman, M.B.A.
Personnel and Industrial Rel.
Northrop Corp.
- Christine L. Hobart, D.B.A.
Personnel and Industrial Rel.
Northeastern University
- Elizabeth L. Hodges, Ph.D.
English
Mark O. Hodgson, M.A.
- Anthropology/Sociology
McLean Hospital

- Richard J. Hoffmann, B.S.
Therapeutic Recreation
Creative Educational Assoc.
- Therese M. Hofmann, M.A.
Speech
Marshfield High School
- Gary J. Hofstetter, M.Ed.
Therapeutic Recreation
Newton Recreation Dept.
- Dennis Hogan, M.B.A.
Marketing
Roberts & Associates
- Wesley P. Holbrook, B.S.
Industrial Management
Retired
- Robert Holmstrom, M.S.
Earth Science
Dynamics Research Corp.
- Susan W. C. Holton, M.A.
Anthropology/Sociology
Northeastern University
- Wilfred E. Holton, Ph.D.
Anthropology/Sociology
Northeastern University
- Morris Horowitz, Ph.D.
Economics
Northeastern University
- William J. Hourihan, Ph.D.
History
Northeastern University
- Emanuel Howard, J.D.
Political Science
Kowal & Kowal
- Martin J. Howard, M.B.A.
Accounting
Commonwealth of Mass.
- Jane A. Howe, B.S.
Anthropology/Sociology
- Thomas J. Hubbard, M.B.A.
Marketing
Epson America, Inc.
- Anthony H. Hull, Ph.D.*
History
- Thomas K. Humphreys, M.A.
Economics
Merrill Lynch
- Robert A. Hunter, M.A.*
English
Mansfield High School
- Daniel F. Hurley, LL.B.*
Personnel and Industrial Rel.
Consultant
- Mohammed M. Hussein, M.A.
Modern Language
- Merle D. Hyman, J.D.
Personnel and Industrial Rel.
U.S. Dept. of Labor
- Jack F. Ingalls, M.S.
Law Enforcement
Consultant
- John J. Irwin, Jr., J.D.
Law Enforcement
Justice, Mass. Supreme Court
- Mervyn Israel, Ph.D.*
Chemistry
Sidney Farber Cancer Inst.
- Herbert H. Itzkowitz, M.B.A.*
Accounting
Forman, Itzkowitz & Berenson
- Judith Jack, B.A.
English
GTE Corporation
- Michael W. Jackson, Ph.D.
Health Professions
Adams Russell Co.
- Phillip S. Jackson, Esq., LL.B.*
Law
Self-Employed
- Donald M. Jacobs, Ph.D.
History
Northeastern University
- Joshua R. Jacobson, M.A.
Music
Northeastern University
- Thomas E. Jaillet, M.A.*
Law Enforcement
Sandwich High School
- Paul A. Janell, Ph.D.
Accounting
Northeastern University
- Chester A. Janiak, M.S.
Political Science
Northeastern University
- Arthur W. John, M.B.A.
Management
Data General Corp.
- Carson C. Johnson, Jr., Ph.D.*
Psychology
Emmanuel College
- Donald R. Johnson, M.B.A.*
Personnel and Industrial Rel.
New England Telephone Co.
- John W. Johnson, M.B.A.
Personnel and Industrial Rel.
Digital Equip. Corp.
- Karen S. Johnson, M.A.
Anthropology/Sociology
Harvard University
- Robert F. Johnson, J.D.*
Law Enforcement
First Security Service Corp.
- Rosaleen M. Johnson, M.A.
Mathematics
- James R. Johnston, B.S.
Real Estate
Casey and Dennis
- Joseph M. Jordan, M.P.A.*
Law Enforcement
Boston Police Dept.
- David M. Jouffai, M.A.
Economics
Northeastern University
- Frank J. Joyce, B.S.
Law Enforcement
- Jane Joyce, M.Ed.
Women's Career Program
Sweetheart Plastics, Inc.
- Joseph A. Kaczenas, B.S.
Information Systems
New England Mutual Life Ins.
- Farhoud Kafi, M.A.
Economics
Northeastern University
- Martin J. Kahan, B.S.
Information Systems
Masi Industries, Inc.
- Mark H. Kaizerman, M.B.A.
Accounting
Stavisky Shapiro & Whyte
- Katherine M. Kalliel, M.Ed.
Women's Career Program
Dean Junior College
- Martin A. Kalustian, M.B.A.*
Management
Raytheon Co.
- Sergei Kan, Ph.D.
Anthropology/Sociology
Northeastern University
- Edward L. Kandib, M.Ed.*
Accounting
Public Accountant
- Donald E. Kane, M.P.A.
Law Enforcement
Barnstable Police Dept.
- Martin J. Kane, M.B.A.*
Purchasing
Raytheon Co.
- F. Patricia Kannon, B.S.
Marketing
Consultant
- Edward M. Kaplan, M.S.
Information Systems
Mass. General Hospital
- Mort S. Kaplan, M.A.*
English
Northeastern University
- Steven D. Karchmar, M.B.A.
Personnel and Industrial Rel.
Wyman-Gordon Co.
- Gary M. Karelis, M.B.A.
Accounting
M. Karelis Wood Heel Co.
- Charles Karis, Ph.D.
Psychology
Northeastern University
- Catherine A. Karp, B.S.*
Biology
Northeastern University
- Earl J. Kasdon, M.D.
Health Professions
Beth Israel Hospital
- Harold D. Kastle, M.A.*
Personnel and Industrial Rel.
Raytheon Co.
- Stanley W. Kaszanek, Jr., M.A.
Anthropology/Sociology
Suffolk University
- Deborah S. Katz, M.B.A.
Finance
Mobil Tyco Solar Energy Corp.
- Robert S. Katz, B.S.
Journalism
Transcript Newspapers
- Ronald P. Kaufman, B.S.*
Law Enforcement
Mass. Dept. of Public Safety
- Robert C. Kazarian, M.A.
Economics
Northeastern University
- Walter E. Kearney, M.B.A.*
Accounting
Northeastern University
- John S. Kearns, Ph.D.
Psychology
Northeastern University
- John A. Keith, Jr., J.D.
Management
Group Insur. Ser. Center Ins.
- Philip E. Keith, M.B.A.
Management
Analog Devices Inc.
- Richard L. Keith, D.B.A.
Accounting
Northeastern University
- William E. Kelley, M.B.A.*
Accounting
Mass. Inst. of Technology
- Thomas W. Kelly, M.B.A.*
Information Systems
Mass. General Hospital
- Patricia Anne Kelly-Delgado, M.Ed.
Reading
Northeastern University
- Solomon Kenea, M.A.
Economics
Northeastern University
- Daniel W. Kennedy, M.A.
Economics
Middlesex Community College
- Edward C. Kennedy, B.S.
Law Enforcement
Retired
- Thomas J. Kennedy, M.B.A.
Finance
MBTA
- Margaret L. Kent, M.A.
English
- Philip M. Keohane, M.A.
Journalism
Transcript Newspapers
- Janice D. Keough, M.A.
English
North Shore Community Coll.
- James J. Kerasiotes, B.A.
Political Science
Northeastern University
- Rostron J. Kershaw, M.S.
Therapeutic Recreation
Northeastern University
- Mary W. Keville, M.P.H.
Health Professions
U. of Mass. Medical Center
- Sonia N. Khan, M.A.
Anthropology/Sociology
Northeastern University

- Carol D. Kimball, J.D.
Law
Dugan & McAuliffe
- Brian L. King, M.B.A.*
Marketing
Self-Employed
- Janet M. King, Ph.D.
English
Harvard University
- Sandra J. King, B.S.*
Information Systems
Shawmut Bank of Boston
- Charles S. Kinney, M.Ed.
Health Professions
Lahey Clinic Medical Center
- Gary F. Kinsella, J.D.
Political Science
Northeastern University
- Paul G. Kinsella, B.S.*
Real Estate
Paul G. Kinsella
- Stephen J. Kirby, M.A.
Health Professions
Addison Gilbert Hospital
- Virginia K. Kirshner, B.A.*
Drama
Lincoln-Sudbury Region. High School
- Lance E. Kisby, D.M.D.
Health Professions
Tufts Univ. Sch. Dental Med.
- William P. Kladky, M.A.
Anthropology/Sociology
City of Waltham
- Joseph N. Kly, Ph.D.
Political Science
Northeastern University
- Mary F. Knapman, A.S.
Health Professions
Framingham Union Hospital
- James P. Kneeland, M.B.A.
Information Systems
Bradford Services, Inc.
- Shirley L. Knight, M.Ed.
Therapeutic Recreation
Northeastern University
- Claire E. Knox, M.L.S.
English
Boston University
- John L. Kobrick, Ph.D.
Psychology
U.S. Army Research Inst. Envir. Med.
- Jean D. Koch, M.A.
English
- Richard J. Kochanowski, M.S.
Economics
U.S. Dept. of Transportation
- Bernhard J. Kohler, M.B.A.
Industrial Management
Polaroid Corp.
- Gerald G. Kokos, M.B.A.
Finance
Digital Equip. Corp.
- Anja S. Kondo, M.A.
Anthropology/Sociology
Northeastern University
- Bennett L. Kramer, M.S.*
Information Systems
Massasoit Community College
- Ernest A. Kraus, M.Ed.*
Therapeutic Recreation
Ernest A. Kraus, Private Cons.
- David H. Kravetz, J.D.*
Law
Widett Slater & Goldman, P.C.
- Steven A. Kravetz, M.B.A.
Accounting
Apparel Retail Corp.
- Jane M. Kretchman, B.S.
Health Professions
Coulter Biomed. Research Corp.
- Michael P. Krone, J.D.
Law
Private Law Practice
- Tina Krontiris, M.A.
English
Northeastern University
- Susan R. Kuder, M.A.
English
- Bruce G. LaFlamme, M.S.W.
Health Professions
Mass. Dept. Mental Health
- Paul K. Lambert, M.B.A.*
Transportation
Consultant
- Ronald Lamoly, M.A.
Law Enforcement
Mass. State Police
- Philip J. Lamy, B.A.
Anthropology/Sociology
Northeastern University
- Stephen R. Lancey, Ph.D.
Psychology
Boston Medical Center
- Robert H. Landry, M.B.A.*
Accounting
Massasoit Community College
- Mariantonia Lanza, C.A.G.S.
Reading
BHS
- Calvin J. Larson, Ph.D.
Anthropology/Sociology
University of Massachusetts
- Nazma Latif, M.A.
Economics
Northeastern University
- Barry B. Latta, M.S.
Information Systems
Dir. of Employment Security
- Philip J. Laurens, M.S.
Mathematics
Bentley College
- Irma H. Lauter, M.S.M.E.
Information Systems
New England Telephone Co.
- Charles E. Lawton, M.Ed.
English
Rhode Island College
- Alfred Lazzeri, M.F.A.
Art
Walpole High School
- Edward J. Leach, J.D.*
Law Enforcement
Revere Police Department
- Morris G. Learner, LL.B.
Management
- Paul J. LeBlanc, M.A.
English
Boston College
- Stewart L. Lebo, M.S.
Information Systems
First National Bank
- Hollington Lee, B.S.
Biology
- Carlton B. Lehmkuhl, Ph.D.
Earth Science
Northeastern University
- Roger J. F. Lehrberg, J.D.
Real Estate
Attorney
- Randy S. Leibowitz, B.S.
Biology
Biogen Inc.
- Constance Leigh, M.A.
English
- D. Paul Leitch, Ph.D.
Psychology
U.S. Army Natick R&D Command
- Bernard J. Lemire, B.S.
Chemistry
Northeastern University
- Virginia M. Leonard, B.A.
Health Professions
Memorial Hospital
- Philip W. Lequesne, Sc.D.
Chemistry
Northeastern University
- Mary F. Leslie, M.Ed.
Reading
Northeastern University
- Marvin X. Lesser, Ph.D.
English
Northeastern University
- Caren V. Leve, M.A.
Music
- Albert M. Levenson, M.B.A.*
Management Sciences
Charles Stark Draper Lab.
- George E. Levesque, M.S.
Information Systems
Mass. General Hospital
- Douglas R. Levin, M.A.
Health Professions
Northeastern University
- David J. Lewek, M.B.A.
Management
C. T. Main Corporation
- David A. Lewis, B.S.
Chemistry
Northeastern University
- Mary T. Leyden, M.Ed.
Management
U.S. Environment Agency
- Domenic J. Liberatore, M.B.A.
Industrial Management
Raytheon Co.
- Sandra M. Licter, M.Ed.
Information Systems
Raytheon Co.
- Frank M. Limoncelli, B.S.
Marketing
Boston Globe
- Kenneth E. Lindauer, Esq., J.D.
Anthropology/Sociology
Law Office of K. Lindauer, P.C.
- Joanne G. Linowes, M.A.*
Speech
Research Communications, Inc.
- Robert L. Litrownik, Ph.D.
Psychology
Mystic Valley Mental Health Ctr.
- Thomas E. Littlehale, M.Ed.
Information Systems
John Hancock Life Ins.
- Harold Lloyd, M.A.
Political Science
Compugraphic Corp.
- J. Antony Lloyd, M.A.*
English
Beth Israel Hospital
- Joseph S. Locastro, Ph.D.*
Psychology
Boston Medical Center
- John S. Locke, B.S.*
Chemistry
Northeastern University
- Hugh G. Loebner, Ph.D.
Information Systems
Commonwealth of Mass.
- Richard C. Logan, M.B.A.
Health Professions
Newton-Wellesley Hospital
- James A. Lomastro, Ph.D.
Health Professions
J. R. Shaughnessy Rehab. Hosp.
- Nicolo S. Lombardo, M.B.A.
Management
Laventhol & Horwath
- Edward J. Lonczak, M.B.A.*
Management
Commercial Union Insurance
- Mark Love, M.A.
Information Systems
Northeastern University
- Miller C. Lovett, Ph.D.
Management
University of Mass./Boston
- Hope E. Luder, M.A.
History
Burlington High School
- Barbara E. B. Lundeen, M.A.
English
Digital Equipment Corp.
- Richard I. Lustig, Ph.D.
English
Cullinane Database Systems

- John J. Lyons, M.A.
Law Enforcement
Retired
- Paul E. Lyons, B.S.*
Industrial Management
Gillette Co.
- Robert L. Mabardy, M.B.A.
Personnel and Industrial Rel.
C. J. Mabardy, Inc.
- Andrew C. Macaulay, M.S.*
Chemistry
N.E. Medical Ctr. Hospital
- Thomas J. MacDonald, M.A.
History
Town of Norwood
- Edward R. MacCormack, M.P.A.*
Law Enforcement
Boston Edison Company
- Patricia R. MacDonald, M.A.
English
- Ronald C. MacKay, M.A.
English
Northeastern University
- Alan A. Mackey, A.M.*
Mathematics
Registry of Motor Vehicles
- Steven Mackey, M.A.
Music
Brandeis University
- Charles M. MacLean, J.D.
Law Enforcement
Natick Police Department
- Sylvia A. MacPhee, M.S.
Anthropology/Sociology
Lasell Junior College
- Edward F. Madden, A.B.
Law Enforcement
Management Consultant
- John V. Madden, J.D.
Personnel and Industrial Rel.
- William J. Madden, B.S.*
Accounting
Self-Employed
- Judith Magidson, M.Ed.
Reading
Northeastern University
- Ann Marie Maguire, Esq., J.D.
Health Professions
Law Offices Lubin & Meyer
- Gerard E. Maguire, M.B.A.*
Purchasing
Prime Computer, Inc.
- John A. Maguire, B.S.
Information Systems
Commercial Union Assurance
- Thomas J. Maguire, J.D.
Law Enforcement
Retired
- John J. Mahon, J.D.
Personnel and Industrial Rel.
Raytheon Co.
- Robert E. Mairs, B.S.
Personnel and Industrial Rel.
Raytheon Co.
- Takashi Maki, Ph.D.
Biology
New England Deaconess Hosp.
- Helen C. Makris, M.Ed.
English
- Charles E. Maling, M.A.
Economics
First Security Corp.
- Judith Mallette, B.S.
Mathematics
Wakefield Public Schools
- Michael J. Mandracchia, B.S.
Biology
Northeastern University
- Jeremiah J. Manfra, B.S.
Law Enforcement
Boston Police Dept.
- Sabi Manijeh, M.A.
Economics
Northeastern University
- George J. Manikas, B.S.*
Law Enforcement
Raytheon Co.
- William J. Manseau, Ed.D.
Health Professions
Comm. Ctr. Community Health Development
- Albert R. Manson, M.Ed.*
Information Systems
Honeywell Info. Syst., Inc.
- Steven G. Manson, B.S.
Information Systems
Prince Co.
- J. Jack Manuel, Ph.D.*
Philosophy/Religion
Creative Humanistics, Inc.
- John A. Manzo, Jr., M.S.
Industrial Management
N.E. Medical Ctr. Hospital
- Robert P. Marco, M.B.A.*
Health Professions
Brigham & Women's Hospital
- Alfred G. Marcotte, M.S.E.E.*
Mathematics
LFE Corp.
- Sally A. Marcotte, M.Ed.
Therapeutic Recreation
Children's Hospital Medical Center
- Julius Mariasis, M.B.A.*
Management
World Markets
- Steven J. Marino, B.S.
Mathematics
Saugus Junior High School
- Rosemary T. Marotta, M.A.
English
- Bruce E. Marquis, M.A.
Health Professions
Sani-Tech Co.
- Arnold M. Marrow, Esq., LL.B.*
Personnel and Industrial Rel.
Natl. Labor Relations Board
- Barry H. Marshall, M.B.A.*
Accounting
Digital Equipment Corp.
- John E. Marshall, M.B.A.*
Management
Rath & Strong, Inc., Management Consult.
- Barbara E. Martin, B.A.
Health Professions
Northeastern University
- John A. Martin, M.B.A.
Accounting
Northeastern University
- John B. Martin, B.S.
Information Systems
Raytheon Data Systems
- John F. Martin, Ph.D.*
Industrial Management
General Electric Co.
- John J. Martin, M.B.A.*
Personnel and Industrial Rel.
Fed. Mediation & Council. Serv.
- Leo J. Martin, B.S.
Law Enforcement
John W. MacCormack Building
- Susan J. Martin, C.A.G.S.
Health Professions
Brockton Hospital
- Zareh Martin, M.Ed.*
Industrial Management
Martin Management Consultant
- Paul Masi, B.S.
Health Professions
Jay's Pharmacy
- Frederick J. Mason, Jr., B.S.*
Accounting
Internal Revenue Service
- Richard P. Mason, M.B.A.*
Information Systems
Avco Corp.
- Russell B. Mason, M.B.A.*
Marketing
Raytheon Co.
- Joseph D. Mastone, M.A.
Law Enforcement
EG&G Bionomics
- Burton N. Matross, M.B.A.
Information Systems
General Electric
- George D. Matson, M.A.
Speech
Hesser College
- Paul F. Matthews, M.P.A.
Law Enforcement
General Electric Co.
- Kevin E. Mautte, M.S.
Biology
Northeastern University
- Lawrence H. Mayer, B.S.
Personnel and Industrial Rel.
Raytheon Co.
- Cynthia Mayher, M.S.
Health Professions
Northeastern University
- Teresa A. Mayors, B.A.
Anthropology/Sociology
Northeastern University
- James J. Mazza, M.P.A.
Law Enforcement
Woburn Police Department
- Leo F. McCue, Jr., Ph.D.*
History
Central Catholic High School
- Patrick J. McGeary, M.A.
English
Norfolk Mental Health Assoc.
- Richard J. McNeil, Jr., M.B.A.*
Economics
Northeastern University
- Michal V. McAulay, A.S.
English
- Gerard S. McAuliffe, J.D.
Law Enforcement
McAuliffe Atty. at Law
- Robert P. McAuliffe, M.B.A.*
Marketing
Genrad, Inc.
- Paula E. McCabe, A.B.
Anthropology/Sociology
Northeastern University
- Larry D. McCargar, Ph.D.
Philosophy/Religion
- Daniel J. McCarthy, D.B.A.*
Management
Northeastern University
- Francis J. McCarthy, M.B.A.
Information Systems
Leverone & Company, C.P.A.
- John D. McCarthy, M.P.A.
Accounting
U.S. Defense Dept.
- Michael N. McCarthy, Ph.D.
Psychology
University of Mass./Boston
- William S. McCarthy, J.D.
Law Enforcement
Attorney
- John E. McCormack, M.B.A.
Accounting
Youville Hospital
- James F. McDermott, C.P.A., M.B.A.
Accounting
Northeastern University
- Douglas G. McDonald, M.B.A.
Accounting
IC Industries
- Andrew J. McDonough, B.S.*
Insurance
Appleby & Wyman, Inc.
- Matthew McGarrell, M.S.
Music
Northeastern University
- Daniel R. McGrath, M.S.
Psychology
Northeastern University
- John B. McGrath, B.S.*
Finance
N.E. Telephone & Telegraph

- Mary M. McGrath, M.A.
Women's Career Program
 A. L. Neillum & Assoc.
- James L. McGuinness, Jr., M.B.A.*
Accounting
 EG&G, Inc.
- Thomas J. McHugh, M.B.A.*
Finance
 Consultant
- Frederick L. McKenney, J.D.
Real Estate
- Frederick L. McKenney
 Raymond P. McKeon, M.P.A.
Law Enforcement
 Chelmsford Police Dept.
- Mark W. McLaughlin, M.A.
English
 Houghton Mifflin
- Mary T. McLaughlin, M.P.H.
Health Professions
- Robert W. McLean, M.B.A.
Management
 Self-Employed
- Thomas C. McLellan, M.S.
Accounting
 Investors Relocation Group, Inc.
- Joann D. McManamy, M.B.A.
Economics
 Northeastern University
- Joseph W. McNabb, M.A.
Health Professions
 Laboure Junior College
- Thomas J. McNamara, B.S.*
Information Systems
 Honeywell Info. Systems
- Pauline M. McNulty, B.S.
Information Systems
 Digital Equipment Corp.
- Clay McShane, Ph.D.
History
 Northeastern University
- Herbert L. Meiselman, Ph.D.
Psychology
 U.S. Army Natick Labs
- Frank D. Mele, B.S.
Accounting
 Internal Revenue Service
- Kenneth C. Mermer, M.B.A.
Health Professions
 Nevins Home, Inc.
- Sheila Mermin, M.S.
Therapeutic Recreation
- Lloyd B. Merrill, B.S.
Information Systems
 Evans Products Co.
- George B. Merry, A.B.*
Journalism
 Christian Science Publishing
- Charles A. M. Meszoely, Ph.D.*
Biology
 Northeastern University
- Michael W. Metzler, M.A.
Personnel and Industrial Rel.
 Stop & Shop Companies
- Leonard F. Meuse, Jr., M.B.A.
English
 Polaroid Corp.
- Paul Miao, Ph.D.
Biology
 Tufts U.S.D.A. Human Nutrition Ctr.
- Ronald L. Michaud, Ph.D.
Psychology
 Perkins School for the Blind
- George Michels, M.A.
Economics
 Northeastern University
- Elmer B. Michelson, M.A.*
English
 Polaroid Corp.
- Sylvia J. Mignon, M.A.
Anthropology/Sociology
- Philip R. Miles, M.B.A.
Accounting
 Polaroid Corp.
- Adriene R. Miller, M.A.
Anthropology/Sociology
 Northeastern University
- Charles J. Miller, B.S.
Information Systems
 J&J Corrugated Box Corp.
- Dennis H. Miller, Ph.D.
Music
 Northeastern University
- James W. Miller, B.S.
Management
 Bunker Hill Comm. College
- Pearline M. Miller, M.Ed.
Reading
 Mass. Institute of Technology
- Stephen R. Miller, M.L.S.
Library Science
 Wellesley Free Library
- Charles S. Mills, M.D.
Health Professions
 Boston VA Hosp.
- Helena C. Minton, M.F.A.
English
 University of Lowell
- Richard R. Miranda, M.B.A.
Purchasing
 Multibank Financial Corp.
- Nityananda Misra, M.S.M.E.
Industrial Management
 Dennison Manufacturing Co.
- Steven A. Mitchell, Ph.D.
Modern Language
 Harvard University
- Armita Mody, M.A.*
Anthropology/Sociology
 Northeastern University
- Charles E. Mokotoff, M.A.
Music
- James A. Molloy, B.S.
Transportation
 Raytheon Data Services
- James F. Molloy, Jr., M.B.A.
Transportation
 Northeastern University
- Stephen P. Molloy, R.R.A., B.A.
Health Professions
 Lowell General Hospital
- Abdul Momen, M.P.A.
Economics
 Northeastern University
- Lawrence F. Monaghan, B.S.
Information Systems
 First National Bank
- Rajen Mookerjee, M.A.
Economics
 Northeastern University
- Patricia A. Moore, M.A.
Health Professions
 Laboure Junior College
- Leslie B. Morash, M.B.A.*
Transportation
 Service Warehouse Co.
- William R. Morin, M.B.A.
Information Systems
 MBTA
- Jerry A. Morris, M.B.A.*
Personnel and Industrial Rel.
 Ittek Corp.
- Richard M. Morrison, M.B.A.*
Information Systems
 Strategic Planning Institute
- William E. Morrison, Jr., M.B.A.*
Personnel and Industrial Rel.
 Self-Employed
- Peter J. Morrissey, B.S.
Information Systems
 MBTA
- Mark B. Moss, Ph.D.
Psychology
- Henry A. Moultrie II, M.B.A.
Management
 Mission Church of Christ
- Carl F. Moxey, Ph.D.
Biology
 Self-Employed
- James D. Mukjian, M.B.A.*
Industrial Management
 U.S. Defense Logistics Agency
- Paul V. Mulken, M.S.*
Personnel and Industrial Rel.
 U.S. Dept. of Labor
- Edmund J. Mullen, M.Ed.*
History
 Northeastern University
- Francis E. Mullen, B.S.*
Law Enforcement
 Quincy Police Department
- William S. Mullen, M.A.
Political Science
 Foxboro School System
- Bianca M. Murphy, C.A.G.S.
Psychology
 Womanspace Fem. Therapy Coll.
- Charles W. Murphy, M.B.A.
Finance
 Bunker Hill Comm. College
- Daniel C. Murphy, M.S.
Journalism
 Beverly-Peabody Times
- George E. Murphy, J.D.
Management Sciences
 Polaroid Corp.
- James F. Murphy, B.S.
Law Enforcement
 Haverhill Police Dept.
- Paul J. Murphy, J.D.*
Management
 General Electric Co.
- John A. Mylotte, B.A.
English
 Navy Cloth & Text Rsrch. Fac.
- Roland L. Nadeau, M.A.*
Music
 Northeastern University
- David J. Naparstek, M.S.
Health Professions
 Nashoba Assoc. Boards of Health
- John D. Nash, M.A.
Health Professions
 Sidney Farber Cancer Inst.
- Shashi Nath, Ph.D.*
Anthropology/Sociology
- Barbara E. Neale, M.Ed.
Speech
 Independent Concept Consult.
- Theodore H. Needie, B.S.*
Accounting
 Needle & Needle
- Mitchell J. Nelles, Ph.D.
Biology
 Rosentiel Research Ctr.
- David C. Nelson, B.S.
Accounting
 David C. Nelson
- Martin A. Nemzow, B.S.
Information Systems
 Solvation, Inc.
- Thomas J. Neylon, Jr., M.A.*
English
 Watertown Public Schools
- Janet M. Nichols, M.B.A.
Management
 IDE Corp.
- Bruce E. Nickerson, Ph.D.
Anthropology/Sociology
 Stone & Webster Eng. Corp.
- Judith Nierenberg, M.Ed.
Anthropology/Sociology
 Documentary Educ. Resources
- Marion L. Nieritz, C.A.G.S.
Personnel and Industrial Rel.
 John Hancock Mutual Life
- Gunnar Y. Nilsson, B.A.
Art
 Hewlett-Packard Co.
- James C. Nolan, M.S.W.
Personnel and Industrial Rel.
 MBTA
- Richard W. Norton, B.A.*
Information Systems
 The Foxboro Company
- Vincent G. Norton, M.B.A.
Personnel and Industrial Rel.
 Raytheon Co.

- Martin Nosowitz, M.A.
Chemistry
Northeastern University
- Edward G. Novello, B.S.*
Transportation
Best T&D Assoc.
- Fatemeh Nowshad, M.S.
Chemistry
Northeastern University
- Alexander S. Nunes, M.S.
Information Systems
Data General Corp.
- Jane M. Nunes, B.A.
American Sign Language
Northeastern University
- Norbert F. Nunes, M.A.
English
Mass. Bay Community College
- Marie M. O'Brien, Ph.D.
Marketing
University of Lowell
- Robert M. O'Brien, B.S.*
Information Systems
Northeastern University
- Frederick T. O. Connell, J.D.
Accounting
Internal Revenue Service
- Clement O'Brien, M.B.A.
Marketing
Digital Equipment Corp.
- Ellen G. O'Brien, M.Ed.
Personnel and Industrial Rel.
Xerox Corp.
- Richard J. O'Brien, B.S.
Information Systems
Mass. General Hospital
- William T. O'Brien, M.P.A.*
Law Enforcement
Boston Police Department
- George C. O'Grady, B.A.
Information Systems
Digital Equipment Corp.
- Joseph A. O'Keefe, M.Ed.
Law Enforcement
Dept. of Public Safety
- Shelagh K. O'Rourke, M.Ed.
Anthropology/Sociology
Harvard University
- Freya E. Oberle, B.A.
Music
- David H. O'Brien, M.B.A.*
Accounting
N.E. Merchants Bank
- Gerard J. O'Connell, Jr., J.D.
Finance
Honeywell Info. Systems
- Daniel F. O'Connor, M.S.*
Information Systems
Nixdorf Computer Corp.
- Edward J. O'Connor, B.A.
Information Systems
Processing Management, Inc.
- Aileen J. Ofer, M.A.*
English
- Suzanne Ogden, Ph.D.
Political Science
Northeastern University
- Ernest Oliveira, Jr., M.B.A.*
Industrial Management
General Electric Co.
- Jon Nelsons Oliver, M.A.
Therapeutic Recreation
Creative Educational Assoc.
- Wayne J. Oliver, M.A.
Economics
Algonquin Gas Transmission
- Gerald F. Olsen, M.B.A.
Accounting
Digital Equipment Corp.
- George C. Olson, M.B.A.*
Information Systems
Home Savings Bank
- Kirtland H. Olson, M.A.
English
The Harvard Group
- Ronald K. Olson, B.A.*
Information Systems
Prime Computer Corp.
- David S. Omar, M.B.A.*
Economics
Dean Junior College
- James W. O'Neill, A.B.*
Law Enforcement
Security Consultant
- Nancy P. Orton, B.A.
English
- George J. O'Shea, Jr., M.S.W.
Law Enforcement
Division of Youth Service
- Richard H. O'Shea, M.P.A.
Law Enforcement
State of N.H., Dept. of Education
- Linda C. Ott, M.A.
Music
Northeastern University
- Susan M. Ott, M.A.
Psychology
Northeastern University
- Albert J. Ottariano, M.B.A.*
Economics
U.S. Dept. of Labor
- Carol A. Owen, Ph.D.
Anthropology/Sociology
Northeastern University
- Richard W. Paine, Ph.D.*
Psychology
- Howard R. Palmer, J.D.*
Law Enforcement
Attorney General's Office
- Leo Panas, M.S.
Art
University of Lowell
- Virginia C. Parsons, M.A.
English
Northeastern University
- S. Jack Pashoogian, B.S.
Mathematics
- Paul S. Paslaski, M.B.A.
Information Systems
Digital Equipment Corp.
- Herbert S. Patchell, M.A.
Philosophy/Religion
- Theodore C. Patrikas, B.S.*
Management
General Electric Co.
- David F. Pauling, M.A.*
Modern Language
Northeastern University
- Neal S. Peachey, M.A.
Psychology
Northeastern University
- Joseph V. Pearincott, Ph.D.
Biology
Northeastern University
- Joseph C. Pedula, B.S.
Personnel and Industrial Rel.
Gillette Co.
- William B. Peirce, M.B.A.
Finance
Cape Cod Community College
- Robert A. Pelletier, B.S.
Information Systems
Commercial Union Assur. Co.
- Katherine N. Pendergast, M.Ed.
Personnel and Industrial Rel.
Northeastern University
- Martin L. Pendleton, Jr., B.S.*
Information Systems
Agency Management Systems
- Carroll E. Pennell II, M.A.I., M.B.A.*
Real Estate
C. W. Whittier & Bros.
- Rohe V. Pennington III, B.A.
Psychology
Northeastern University
- William A. Percy, Ph.D.*
History
University of Mass./Boston
- Timothy P. Perkins, M.A.
English
Northeastern University
- William J. Peros, M.S.
Biology
Northeastern University
- Harry J. Perreault, B.S.
Information Systems
Liberty Mutual Ins. Co.
- Richard A. Perrin, M.B.A.
Information Systems
Mass. General Hospital
- Peter E. Peroncello, M.S.
Law Enforcement
Norfolk County Sheriff Dept.
- Curtis M. Perry, M.B.A.
Accounting
Keith Junior High School
- Eileen C. Perry, B.S.
Health Professions
Lahey Clinic Medical Center
- Daniel Pershonok, Ph.D.*
Psychology
Harvard Medical School
- Stuart S. Peterfreund, Ph.D.
English
Northeastern University
- Frederick D. Peterson, M.A.
Anthropology/Sociology
Merrimack College
- Ausrele M. Petronis, M.Ed.*
English
Petronis & Goldman Assoc.
- Marie J. Philip, B.A.
American Sign Language
Northeastern University
- Peter T. Philliou, Ph.D.*
Mathematics
Wentworth Institute
- Eugene Piazza, B.S.
Finance
Quincy Junior College
- Robert W. Picco, B.A.
Information Systems
Northeastern University
- Lawrence M. Pidgeon, J.D.
Law
Attorney-at-Law
- Robert E. Pieciewicz, M.S.
Management
American Mutual Liability Ins.
- George G. Pierce, J.D.*
Law
U.S. Government
- Karen L. Pierce, A.S.
Information Systems
- Benjamin E. Pike, M.B.A.*
Personnel and Industrial Rel.
Massasoit Community College
- Joseph G. Pike, M.A.
Health Professions
Eastern Mass. PSRO
- Karen F. Pike, M.Ed.
Art
- Gerald T. Pineault, M.B.A.
Industrial Management
Polaroid Corp.
- Elizabeth R. Pisanelli, B.A.
Biology
Northeastern University
- Garth I. Pitman, Ph.D.*
English
Trident Regional High School
- Carmen S. Pizzuto, Ph.D.*
Law Enforcement
Dept. of Youth Services
- Harlan B. Plumley, M.B.A.
Finance
Digital Equipment Corp.
- Zbigniew M. Poddubiuk, Ph.D.
Health Professions
Northeastern University
- Karen L. Pokross, M.Ed.
Therapeutic Recreation
Veterans Administration
- Gladys M. Polansky, M.A.*
English

- Terry L. Poling, M.A.
Speech
Factory Mutual Systems
- Richard W. Pomeroy, B.A.
Information Systems
Pomeroy Associates
- Dennis A. Pope, B.S.
Health Professions
Danvers Pathology Assoc.
- Charles J. Porfert, B.A.
Security
- John D. Post, Ph.D.*
History
Northeastern University
- Sylvia Poster, M.B.A.
Management
Bridgewater State College
- Joseph L. Potts, M.B.A.
Finance
Burgess & Leith, Inc.
- James E. Poulos, M.A.
English
Northeastern University
- Edward J. Powers, M.B.A.*
Industrial Management
Self-Employed
- Stephen J. Powers, M.S.
Information Systems
Avco Everett Research Lab.
- Steven J. Pozzi, M.A.
Economics
Northeastern University
- Michael J. Princi, J.D.
Law Enforcement
Garnick & Princi, P.C.
- Alfred Prokop, M.S.
Health Professions
Gibco Laboratories
- Wayne H. Pueschel, B.A.
English
Prine, Inc.
- Edward V. Puopolo, J.D.*
Law
Puopolo & Carr, Law Attys.
- Carlton Purcell, M.B.A.
Information Systems
Boston Export Management Co.
- Abdul Quayyum, M.S.
Economics
Northeastern University
- Daniel F. Quinn, B.S.
Information Systems
Northeastern University
- Andrea Quintiliani, B.S.
Mathematics
Boston Safe Deposit & Trust Co.
- Frank B. Quirk, M.A.
Information Systems
Commonwealth of Mass.
- Leslie S. Radcliffe, M.A.
English
Computervision Corp.
- Hugh P. Rafferty, M.A.
Law Enforcement
Dorchester Municipal Court
- Anisur Raham, M.A.
Economics
Northeastern University
- Mohamed A. Rahman, Ph.D.
Economics
- Jonathon E. Rakin, M.A.
Economics
Northeastern University
- William V. Ramaskewich, Jr., B.S.
Therapeutic Recreation
Kennedy Center for Child Dev.
- Malati Ramratnam, Ph.D.
English
Charles T. Main
- Lorin J. Randall, M.B.A.
Finance
Digital Equipment Corp.
- Nathaniel C. Raymond, Ph.D.
Anthropology/Sociology
Univ. Mass. Harbor Campus
- Bernard R. Redgate, M.S.
Information Systems
Framingham Public Schools
- Caroline B. Rees, M.A.
History
International Institute
- Denis G. Regan, Esq., J.D.*
Law
Self-Employed
- Richard M. Regan, LL.B.
Personnel and Industrial Rel.
State Street Bank & Trust
- Lucio E. Rehbein, M.A.
Psychology
Northeastern University
- William M. Reiff, Ph.D.
Chemistry
Northeastern University
- Richard M. Reilly, M.A.
Personnel and Industrial Rel.
American Arbitration Assoc.
- Stewart Reiser, Ph.D.
Political Science
Northeastern University
- Frank C. Renew, Jr., M.A.
Psychology
Northeastern University
- William J. Rennie, M.B.A.
Transportation
Boston & Maine Railroad
- Janet R. Reohr, Ph.D.
Psychology
Northeastern University
- Evan B. Rich, M.B.A.
Finance
Stone & Webster Eng. Corp.
- Peter J. Richards, M.A.
History
Massachusetts Historical Soc.
- Herbert L. Richmond, C.A.G.S.
Therapeutic Recreation
Area II Homecare Senior Cit.
- David S. Richwine, M.A.
Journalism
United Press International
- Stephen L. Ridge, M.B.A.
Accounting
Textron
- Frederick W. Riley, J.D.
Law Enforcement
Asst. Attorney General
- J. Scott Riley, B.S.*
Marketing
JSR Associates, Inc.
- William J. Riley, M.Ed.
Law Enforcement
Brookline Police Department
- Virginia C. Risse, M.Ed.
Anthropology/Sociology
Mass. Mental Health Center
- Daniel J. Roberts, M.Ed.
Accounting
Northeastern University
- Frank M. Robinson, Jr., C.A.G.S.
Therapeutic Recreation
Northeastern University
- Holbrook C. Robinson, Ph.D.
Modern Language
Northeastern University
- Raymond H. Robinson, Ph.D.
History
Northeastern University
- Leo F. Roche, Jr., LL.B.*
Finance
Darling & McLaughlin
- Cephas B. Rogers, M.B.A.*
Industrial Management
Polaroid Corp.
- Ralph V. Rogers, M.A.
Anthropology/Sociology
Boston City Hall
- William H. Rogers, M.Ed.
Transportation
Wang Laboratories
- Theodore Role, M.A.
Personnel and Industrial Rel.
Arbitrator
- Irene L. Roman, M.Ed.
Accounting
Newton North High School
- Lawrence J. Romano, M.A.*
Modern Language
Charles Stark Draper Lab.
- Robert R. Romeo, Jr., B.A.
Information Systems
Raytheon Co.
- Fred A. Rosenberg, Ph.D.
Biology
Northeastern University
- Joel M. Rosenfeld, M.S.*
Industrial Management
Strategic Planning Inst.
- Norma P. Rosin, M.Ed.
Reading
Northeastern University
- Richard S. Ross, M.A.
History
Louis J. Rossi, Jr., M.B.A.
- Accounting
National Fire Protect. Assoc.
- Robert J. Roth, B.S.*
Law Enforcement
Retired
- James R. Rowell, Jr., Ph.D.
Information Systems
North Shore Comm. College
- Richard N. Roy, M.B.A.
Transportation
Stone & Webster Eng. Corp.
- Gerald R. Rubin, B.S.*
Accounting
Green Rubin & Miller
- Louis Rudzinsky, B.S.*
Personnel and Industrial Rel.
Louis Rudzinsky Assoc., Inc.
- Marilyn L. Rumph, M.A.
Psychology
Honeywell
- Robin R. Rumph, M.A.
Psychology
Northeastern University
- Thomas R. Rutishauser, B.S.
Music
Frank L. Ryan, Ph.D.*
- English
Stonehill College
- P. Barry Ryan, Ph.D.
Chemistry
Harvard School of Public Health
- William H. Ryan, B.S.
Law Enforcement
City of Haverhill
- Charles M. Ryder,
Management
New England Mutual
- John D. Ryder, M.B.A.*
Accounting
SCA Services, Inc.
- Frederick J. Rys, M.B.A.
Finance
New England Telephone Co.
- Alexander R. Rysman, Ph.D.
Anthropology/Sociology
Northeastern Univ.
- Charles L. Saccardo, Jr., M.A.*
Economics
University of Lowell
- David J. Sack, B.S.
Health Professions
Brigham & Women's Hospital
- Thaddeus P. Sadowski, M.Ed.*
Mathematics
North Quincy High School
- Louisegeid Sahl, M.A.
Economics
Northeastern University
- Carol R. Saivetz, Ph.D.
Political Science
Northeastern University

- Tadashi Sakamoto, M.A.
Modern Language
Charles L. Sakey, M.A.*
Modern Language
Boston Latin School
George J. Salm, B.A.
Political Science
Northeastern University
Mary E. Salus, M.A.
Anthropology/Sociology
Mass. Dept. Public Welfare
James B. Sampson, Ph.D.
Psychology
U.S. Army Research Inst. Envir.
Med.
Richard P. Samuels, M.S.M.E.*
Mathematics
New England Telephone Co.
Paul E. Sanders, M.B.A.
Finance
Honeywell Info. Systems
Yvonne L. Sandstrom, Ph.D.
Modern Language
Southeastern Mass. Univ.
Jayant N. Sane, Ph.D.
Chemistry
The Gillette Co.
Richard H. Saracusa, M.B.A.
Information Systems
Raytheon Co.
Ahmad Saranjampour, M.A.
Economics
Northeastern University
Abdul Sattar, M.A.
Information Systems
Willis L. Saulnier, M.S.W.*
Personnel and Industrial Rel.
Creative Enterprises
Stephen R. Savage, B.A.
Art
Centronics
Eunice Schatz, M.A.
Women's Career Program
Life/Work Direction
Frank T. Schettino, M.S.
Law Enforcement
Northeastern University
Donald S. Scheufele, Ph.D.
Chemistry
Boston Public Schools
John J. Schickling, M.B.A.
Accounting
Telesis Corp. of Del.
William J. Schmid, B.S.
Marketing
U.S. News & World Report
Fred N. Schneeweiss, Pharm.D.
Health Professions
Northeastern University
Roy M. Schoenfeld, Esq., J.D.*
Personnel and Industrial Rel.
Natl. Labor Relations Board
Harry G. Schortmann, Jr., M.B.A.
Transportation
Retired
Lucy J. Schuman, B.S.
Health Professions
Randolph School
Daniel C. Scioletti, Jr., M.S.
Accounting
EG&G, Inc.
Frank J. Seegraber, A.B.*
Library Science
Boston College
Harvey J. Segall, A.S.
Journalism
Harvey J. Segall, Photography
Peter K. Seibert, M.B.A.
Transportation
Multisystems, Inc.
William M. Seiple, Ph.D.
Psychology
Northeastern University
Peter M. Selig, M.A.*
Economics
Abu K. Selimuddin, M.A.
Economics
Northeastern University
Patricia C. Selleck, B.S.
Health Professions
St. Ann's Hospital
Peter Serenyi, Ph.D.*
Art
Northeastern University
Anthony K. Sestokas, Ph.D.
Psychology
Northeastern University
Kathleen M. Sevigny, M.S.
Accounting
Terkelsen Molding Co.
John W. Shank, M.S.
Therapeutic Recreation
Northeastern University
John C. Shannon, M.A.*
Economics
Suffolk University
Robert J. Shannon, M.S.
Health Professions
VA Medical Center
Ellen R. Shapiro, Ph.D.
Art
Samuel Shapiro, M.B.A.*
Finance
Samuel Shapiro & Co., C.P.A.
Garrett M. Sheehan, M.S.
Law Enforcement
Lowell Police Dept.
Robert J. Sheehan, M.A.
Security
Defense Investigative Services
Judy A. Shepardskegl, M.A.
Psychology
Northeastern University
Joseph R. Sheppeck, M.B.A.
Mathematics
Boston English High School
Arthur Sherman, J.D.*
Law
Trial Court of Commonwealth
Eliot H. Sherman, M.B.A.
Finance
Pellon Corp.
Stephen M. Shinnick, M.P.A.
Political Science
Norwood Public Schools
Henrietta M. Shmase, B.A.
Health Professions
Health Record Admin. Program
Alan R. Schneider, M.B.A.
Accounting
Alan R. Shneider
Ruth E. Shore, M.A.*
English
Fisher Junior College
Paul M. Short, M.S.
Management
U.S. Army R&D Command
Ronald A. Shulman, M.C.E.
Marketing
Business Comm. Service, Inc.
Andrew Silverman, M.S.
Accounting
Andrew Silverman, C.P.A.
Herbert H. Silverman, Ed.D.*
Music
Northeastern University
George H. Simmons, Jr., M.A.
Economics
Dept. of Public Utilities
Michael L. Simmons, M.P.A.
Political Science
Commonwealth of Mass.
S. Murray Simons, M.B.A.*
Accounting
Mental Health Ctr., Southern N.H.
Sandra A. Skelly, B.S.
Therapeutic Recreation
Hospice of Good Shepherd
Lloyd A. Skiffington, Ph.D.*
English
Northeastern University
Vernon Skipper, B.S.
Management
The Boston Company
Donald O. Smith, Esq., J.D.
Law
Attorney
Frederick I. Smith, Jr., B.A.
Political Science
Commonwealth of Mass.
Malcolm V. Smith, B.S.*
Mathematics
New England Life
Peter H. Smith, M.B.A.
Accounting
Honeywell Electro-Optics
Robert W. Smith, B.S.
Personnel and Industrial Rel.
Northrop Corp.
Stephen W. Smith, M.A.
History
Northeastern University
Paul E. Snoonian, Sr., Ph.D.
Economics
University of Lowell
Leo Snyder, M.S.*
Music
Northeastern University
Nancy P. Snyder, M.S.
Psychology
Priscilla Hoffnung Assoc.
Carlos M. Soares, M.A.
Psychology
Harvard University
Edward J. Socha, M.B.A.
Management
Assabet Valley Reg.-Voc. H.S.
Harold P. Sock, Ed.D.
Women's Career Program
Gateway Counseling Services
Susan S. Sock, M.Ed.
Women's Career Program
Mass. Bay Community College
Sulo A. Soini, M.B.A.
Industrial Management
Commonwealth of Mass.
Kenneth C. Solano, M.Ed.
Personnel and Industrial Rel.
Northeastern University
Edward L. Sousa, M.Ed.
Information Systems
MGR Telecommunications
Robert V. Sparks, Ph.D.*
History
Massachusetts Historical Soc.
Elliot Spector, Ph.D.
Law Enforcement
Northeastern University
Robert M. Spector, Ph.D.*
History
Worcester State College
Robert W. Spiegel, M.B.A.
Health Professions
Community Care Systems
John F. St. Cyr, LL.B.
Law Enforcement
District Court Justice
Francis C. Stacey, M.B.A.*
Management
Retired
George H. Stacey, Jr., M.B.A.*
Information Systems
Stacey Associates, Inc.
Lee B. Staebler, M.B.A.*
Accounting
University of Mass./Boston
Joseph V. Stanford, LL.B.
Finance
Prudential Life Insurance Co.
Ronald Stapleton, B.S.
Law Enforcement
Boston Police Department
Steven A. Stargardt, M.A.
History
Northeastern University

- Thomas P. Stark, M.B.A.
Finance
MFE Corp.
- Charles K. Stefanidakis, M.B.A.
Accounting
T. I. Raleigh, U.S.A.
- Barry D. Stein, B.S.
Biology
Northeastern University
- Alan E. Steinberg, J.D.*
Real Estate
Self-Employed
- Lee J. Steingisser, M.D.
Health Professions
M. Thornton Health Plan, Inc.
- Marvin Stern, A.M.
History
Northeastern University
- Thomas J. Stockett, B.S.*
Personnel and Industrial Rel.
New England Mutual Life Ins. Co.
- George L. Stockman, B.A.
Marketing
Stockman Paulhus Andrews, Inc.
- Edmund L. Stoddard, M.S.
English
Raytheon Co.
- Joseph F. Stoltz, Ph.D.
Economics
U.S. Dept. of Labor
- Deborah Stott, Ph.D.
Art
Radcliffe College
- John W. Stout, M.A.*
Political Science
Roger Williams College
- James J. Stratford, Jr., J.D.*
Law Enforcement
Attorney-at-Law
- Walter D. Stringer, B.S.
Purchasing
Prime Computer
- Mary B. Stupnik, M.P.A.
Economics
New England Merchants Bank
- Edward Sulesky, J.D.
Personnel and Industrial Rel.
Dist. Ct. of Central Middlesex
- Albert W. Sullivan, J.D.
Real Estate
U.S. Postal Service
- Daniel P. Sullivan, M.B.A.
Economics
Trans. Systems Center
- Daniel J. J. Sullivan, J.D.
Personnel and Industrial Rel.
U.S. Department of Labor
- Jeremiah J. Sullivan, Jr., J.D.
Personnel and Industrial Rel.
- Jeremiah G. Sullivan, B.S.*
Information Systems
Digital Equipment Corp.
- John F. Sullivan, B.S.
Personnel and Industrial Rel.
Stone & Webster Eng. Corp.
- Marianne I. Sum, M.A.
History
Northeastern University
- Carol M. Sundberg, B.S.
American Sign Language
Northeastern University
- Barbara S. Sunstein, M.Ed.
English
- Joseph L. Supple, A.B.
Information Systems
Digital Equipment Corp.
- Margaret R. Swana, M.S.
Health Professions
Emerson Hospital
- William R. Swartz, M.B.A.
Industrial Management
Business Systems Assoc.
- Joseph Sweeney, M.B.A.
Information Systems
Interactive Data Corp.
- Allen M. Swenson, M.B.A.*
Economics
Raytheon Co.
- Richard G. Swensson, Ph.D.
Psychology
Harvard Medical School
- George J. Swidler, M.Ed.*
Law Enforcement
Sullivan Agency
- Gary G. Swindon, M.B.A.
Management
Data General Corp.
- James A. Sylvester, M.B.A.
Finance
U.S. Coast Guard
- Lawrence E. Symington, Ph.D.*
Psychology
U.S. Army Natick Research Dev. Lab.
- Eli Szklanka, B.A.
Information Systems
The EDP Corporation
- Thomas J. Tagliamonte, M.B.A.
Management
New England Mutual Life Ins. Co.
- Hugh J. Talbot, M.P.A.*
Law Enforcement
Northeastern University
- Daniel E. Tanguy, M.A.
Information Systems
Mass. General Hospital
- Joyce K. Tapper, M.Ed.
Reading
Polaroid Corp.
- Sumner B. Tapper, M.Ed.*
English
Stoughton High School
- Louise Tarsy, M.A.
Reading
- Theodore A. Tasis, M.A.*
English
Raytheon Co.
- Alan M. Tattle, M.Ed.*
Information Systems
City of Lynn School Dept.
- Gloria J. Taylor, M.A.
Anthropology/Sociology
Commonwealth of Mass.
- Roger B. Taylor, Esq., M.A.
Economics
Northeastern University
- Paul H. Tedesco, Ph.D.*
History
Northeastern University
- Stanley R. Tembridge, Ph.D.
History
Northeastern University
- Maurice Temple, M.S.*
Mathematics
University of Mass./Boston
- John B. Tessicini, M.B.A.
Personnel and Industrial Rel.
F. L. Roberts & Co., Inc.
- Peter T. Tessicini, I.U.C., M.Ed.
Law Enforcement
Tessicini Photography
- Norman R. Tessier, C.A.G.S.
Accounting
School Committee, City of Boston
- Corey R. Tevan, D.F.A.*
Art
Memorial Hall Library
- Diane L. Thatcher, M.S.
Therapeutic Recreation
Northeastern University
- Alan P. Thayer, Esq., M.B.A.*
Economics
Boston College
- Ted Thomas, Jr., B.S.
Anthropology/Sociology
Northeastern University
- Wendy W. Thompson, M.L.*
History
Lexington Public Schools
- Robert M. Thornton, M.B.A.
Accounting
Town of Norwood
- Henry L. Tischler, Ph.D.*
Anthropology/Sociology
Framingham State College
- Mark W. Tobin, B.S.
Health Professions
Ellis Nursing Home
- William J. Tobin, M.P.A.*
Law Enforcement
Executive Protection Service
- Ronald C. Tocci, B.S.*
Accounting
Self-Employed
- Patrick F. Todd, M.Ed.
Management
Northeastern University
- Roy M. Tollefson, Ph.D.
Political Science
Northeastern University
- Arthur J. Tonelli, B.S.
Information Systems
Nthrop Corp.
- James M. Toomey, M.P.A.
Law Enforcement
Mass. State Police
- Lloyd A. Torgove, M.B.A.
Management
Ramada Inn
- Richard W. Torian, M.Ed.*
Mathematics
Ashland High School
- Bernard A. Torri, B.A.
Management
Mt. Ida Junior College
- Frank M. Tortora, M.A.
Economics
Northeastern University
- Victor H. Tose, M.B.A.
Accounting
Eastern Nazarene College
- Rosario J. Tosiello, Ph.D.
History
Pine Minor College
- Allan Tosti, M.P.A.*
Political Science
Mass. Municipal Association
- Harvey L. Towvim, Esq., J.D.
Law
Self-Employed
- Edward G. Trachtenberg, M.B.A.
Information Systems
Raytheon Co.
- Joseph J. Travia, Jr., M.B.A.
Accounting
Arthur D. Little, Inc.
- Gail L. Travis, M.A.
Anthropology/Sociology
- Charles M. Trimbach, Jr., Ph.D.
Psychology
Northeastern University
- Maureen P. Tsinzo, B.S.
Health Professions
VA Medical Center
- Ray K. Tsuchiyama, M.A.
English
Digital Equipment Corp.
- James D. Turley, Ed.D.*
English
Rhode Island College
- David W. Tutein, M.A.
English
- Theresa H. Twombly, M.A.*
Anthropology/Sociology
- Joseph Vaccaro, M.A.
History
Northeastern University
- Philip A. Vaccaro, M.B.A.
Management Sciences
Salem State College
- Donat A. Valcourt, B.S.
Information Systems
LFE Corporation

- John Valletta, A.S.
Management
H. Johnson's Motor Lodge
- Zebulon B. Vance, M.D.
Health Professions
New England Deaconess Hospital
- Ivan B. Vandeworke, M.S.
Chemistry
Westwood High School
- Harvey Velstein, C.A.G.S.*
English
Northeastern University
- Sharon A. Vieira, M.B.A.
Accounting
Digital Equipment Corp.
- Robert A. Vinson, M.A.
Economics
Northeastern University
- Robert F. Vitale, M.B.A.*
Information Systems
Data General Corp.
- Philip M. Vitti, M.A.*
Law Enforcement
Boston Police Dept.
- Nancy J. Vogel, B.S.
Therapeutic Recreation
P. Smith, M.D., and L. Simon, M.D.
- Florian J. Von Imhof, Ph.D.
Psychology
Northeastern University
- Paula M. Vosburgh, Ed.D.
Health Professions
Dorothy G. Wagg, R.R.A., B.A.
- Health Professions*
Abu N. Wahid, M.A.
Political Science
Northeastern University
- Jeffrey L. Wain, M.S.
Biology
Northeastern University
- Paul M. Waldron, M.P.A.
Law Enforcement
Comm. Mass. Dept. of Correction
- Ann L. Walsh, J.D.
Health Professions
Northeastern University
- David A. Walsh, M.Ed.
Mathematics
Westwood High School
- John H. Walsh, M.A.
History
Northeastern University
- Martin S. Walsh, M.A.*
History
Dedham School Dept.
- Susan M. Walsh, B.S.
Information Systems
Louise McNamara & Assoc.
- William F. Walsh, M.Ed.
Marketing
Bill Walsh Associates
- Steven M. Walter, B.S.
Health Professions
Lynn Hospital
- John C. Wanamaker, M.B.A.
Information Systems
Self-Employed
- Robert L. Ward, M.Ed.*
Boston Globe
- Susan E. Ward, B.A.
Boston Globe
Northeastern University
- Lorene A. Ware, Ph.D.
Psychology
Tufts N.E. Medical Center
- Lawrence E. Warfield, B.S.
Information Systems
The EDP Corp. (TEC)
- Karen S. Warner, B.A.
English
McCormack and Dodge
- William G. Warwick, C.A.G.S.
Management
Bryant College
- Lois D. Wasserman, Ph.D.*
History
Northeastern University
- Robert W. Wauhkonen, M.A.
English
- Robert C. Webb, Ph.D.*
Psychology
Suffolk University
- Robert L. Webb, M.Ed.
Personnel and Industrial Rel.
Boston Gas Company
- William S. Webb, M.A.*
Law Enforcement
Danvers Police Department
- Frederick H. Weber, M.S.*
Biology
Northeastern University
- William J. Webster, M.B.A.
Finance
First National Bank
- Judith Weilerstein, R.R.A., M.P.H.
Health Professions
Northeastern University
- Richard S. Wein, M.Ed.*
Anthropology/Sociology
Winthrop High School
- Rhoda Weinman, M.B.A.
Personnel and Industrial Rel.
Polaroid Corp.
- Steven A. Weinstein, M.P.H.
Health Professions
Town of Winchester
- Sara C. Weintraub, M.A.
Speech
E. Bridgewater High School
- Edgar Weiss, B.A.
Music
Northeastern University
- Arthur J. Weitzman, Ph.D.
English
Northeastern University
- Daniel A. Welch, M.A.
Law Enforcement
Kingston Police Department
- Jonathan B. Welch, Ph.D.
Finance
Northeastern University
- Robert L. Wells, M.A.*
Art
Northeastern University
- Robert L. Westwater, M.B.A.
Finance
Commercial Union Assurance Co.
- Charles W. White, Ph.D.
English
Southeastern Mass. University
- Margaret N. White, M.A.
Anthropology/Sociology
- Paul F. White, M.A.
Anthropology/Sociology
Quincy Junior College
- Sheila F. White, M.A.
History
Northeastern University
- Susan Whittaker, B.A.
Speech
Joanna Whoolery, M.A.
- Reading*
Brandeis University
- William F. Wickham, M.A.
History
Northeastern University
- Martin D. Wiener, M.B.A.
Management
Martin D. Wiener & Assoc.
- James L. Wiles, Ph.D.*
Economics
Stonehill College
- Elizabeth S. Williams, C.A.G.S.*
Psychology
Suffolk University
- Jayne B. Williamson, M.A.
History
John R. Williamson, M.B.A.
- Women's Career Program*
Raytheon Co.
- David L. Wilmarth, Ph.D.*
Earth Science
Northeastern University
- Alexander B. Wilson, M.A.*
History
Alex Wilson Associates
- George R. Wilson, Jr., M.A.*
History
Sunline Travel Service
- Walter B. Winchenbach, Jr., M.B.A.
Industrial Management
Hewlett-Packard Co.
- Burton Winnick, Esq., LL.B.
Real Estate
Goldstein & Winnick
- Gail S. Wintersteiner, Ph.D.*
Philosophy/Religion
- Robert E. Withstandley, M.B.A.*
Management
Fisher Junior College
- Donald E. Witkoski, M.S.
Management
Cape Code Community College
- Edward H. Witten, M.S.
Chemistry
Northeastern University
- Robert K. Woetzel, Ph.D.
Political Science
Found for Intern. Criminal Ct.
- Steven D. Wornack, Ph.D.
History
Preview Television
- Barbara J. Wood, B.S.
American Sign Language
Northeastern University
- Michael L. Woodnick, M.S.*
Speech
Northeastern University
- George S. Worth, M.S.A.
Transportation
Knapp King Size Corporation
- Steve Worth, Ph.D.
Political Science
Northeastern University
- William C. Wright, M.B.A.*
Management
Wright Enterprises
- Elizabeth J. Wyka, M.A.
Economics
Northeastern University
- Robert T. Yosca, M.S.
Management Sciences
Digital Equipment Corp.
- Diane F. Zaar, J.D.
Personnel and Industrial Rel.
Board of Conciliation & Arbitration
- Joan J. Zabkar, Ph.D.
Psychology
Northeastern University
- William T. Zadrozny, M.B.A.
Finance
John Hancock Financial Serv.
- Anne M. Zaera, B.A.
Information Systems
Shawmut Bank of Boston
- Albert J. Zahka, Esq., J.D.*
Law
First National Bank
- Harold S. Zamansky, Ph.D.
Psychology
Northeastern University
- Paul J. Zambella, M.A.
Law Enforcement
Dept. of Public Safety
- Dorothy M. Zanni, M.S.
Information Systems
Wang Labs
- Walter P. Zanol, B.S.*
Mathematics
Everett High School
- Alan J. Zaremba, Ph.D.
Speech
Northeastern University
- Barry L. Zaslove, M.S.
Earth Science
Northeastern University

Ann L. Zevnik, M.S.

English

The Harvard Group

Stephen P. Zezima, J.D.

Accounting

M/A-COM, Inc.

Joseph A. Zimbone, M.B.A.

Information Systems

Fidelity Management Research Co.

John L. Zimka, Ph.D.*

Accounting

Boston College

Thomas J. Zogby, M.B.A.

Marketing

Chloride Pyrotecor

University Governing Boards and Officers

The Corporation

Julius Abrams	Melanie Dean (Melanie C. Berger)	Richard P. Johnson
William T. Alexander	Virginia Schenkelberger	*Robert L. Johnson
William F. Allen, Jr.	Devine	*Henry C. Jones
Yousef A. As'ad	William O. DiPietro	*George S. Kariotis
*Diana J. Auger	Alfred di Scipio	Walter B. Kelley
*Vincent Barletta	Estelle Dockser	†Frances Kenerson
Allen G. Barry	Dorothy Dodge	Edward M. Kennedy
Lincoln C. Bateson	*William R. Driver, Jr.	Fenton G. Keyes
*Roy H. Beaton	William S. Edgerly	Calvin A. King
†F. Gregg Bemis	*William Elfers	†Asa S. Knowles
Beverly Ann Bendekgey	*Byron K. Elliott	Harvey C. Krentzman
Robert P. Berkowitz	*William P. Ellison	Evelyn M. Lane
Alfred M. Bertocchi	Robert Erickson	*John P. LaWare
Gerald W. Blakeley, Jr.	*Frank L. Farwell	Maurice Lazarus
S. Whitney Bradley	Joseph D. Feaster, Jr.	Allyn Levy
Melvin B. Bradshaw	*James V. Fetchero	Elma I. Lewis
Rexford A. Bristol	*Eldred L. Field	*Kenneth A. Loftman
Edward W. Brooke	Phil David Fine	Edward A. Loring
*Frederick L. Brown	Neal F. Finnegan	*John Lowell
William L. Brown	Joseph F. Ford	*Diane H. Lupean
William H. Bruce, Jr.	Albert S. Frager	*Roderick M. MacDougall
John L. Burns	Brenda J. Furlong	Maurice Mann
Hyman H. Burstein	Murray J. Gart	Robert C. Marini
Victor C. Bynoe	Paul W. Glennon	Evelyn Marran
*Louis W. Cabot	*Lloyd S. Glidden, Jr.	*Lawrence H. Martin
*Norman L. Cahners	John L. Grandin	M. Dorothy Massey
*Thomas E. Cargill, Jr.	*Donald B. Guy	*George J. Matthews
*Richard P. Chapman	*Allan M. Hale	Walter E. Mattson
Richard P. Chapman, Jr.	Edmund Blair Hawley	Peter H. McCormick
Robert F. Chick	Michael E. Haynes	William J. McCune, Jr.
Vessarios G. Chigas	Donald P. Hearth	John G. McElwee
Logan Clarke, Jr.	James S. Hekimian	Katherine Seay McHugh
Livingstone N. Coakley	William Hellman	Percy M. McIntosh
†David H. Cogan	*Ernest Henderson III	Dominic Meo, Jr.
Abram T. Collier	Joseph E. Heney	Don G. Mitchell
T. Paul Connolly	James S. Herbert	Donald H. Moore
James J. Costello	Arnold S. Hiatt	Frank E. Morris
Edward Creiger	Richard D. Hill	James A. Morris
H. James Crossan, Jr.	Thomas Hollis, Jr.	E. James Morton
John J. Cullinane	D. Brainerd Holmes	N. Laurence Nagle
Roger C. Damon	Robert W. Holmes	William H. Nichols, Jr.
Nelson J. Darling, Jr.	Hartwell G. Howe	Kathryn M. Nicholson
J. H. Dow Davis	John S. Howe	Bernard J. O'Keefe
	Howard M. Hubbard	Stanley C. Olsen
	*Carl R. Hurtig	James H. Orr

*Member of the Board of Trustees

**Honorary Trustee

†Lifetime Trustee, Emeritus

Edward O. Owens
Ara Oztemel

*Augustin H. Parker
Edward S. Parsons

*Amelia Peabody
Theodore R. Peary

Lawrence T. Perera
Nicholas V. Petrou

Edward E. Phillips
*Thomas L. Phillips

Edward D. Phinney
Rudolph F. Pierce

Jerome M. Powell
Albert Pratt

John F. Prendiville
Peter W. Princi

*William J. Pruyn
George Putnam

Blanche M. Quaid
*Francis J. Quirico

William H. Raye, Jr.
Kathleen M. Rice

D. Paul Rich
Robert Riesman

R. Earl Roberson
Daniel J. Roberts

†Dwight P. Robinson, Jr.
Ralph B. Rogers

Ronald L. Rossetti
*Kenneth G. Ryder

Ernest J. Sargeant
Donald W. Seager

Sydney Shaftman
James L. Shanahan

Robert E. Siegfried
*Dorothy M. Simon

Philip A. Singleton
Paul D. Slater

**Donald W. Smith
*Farnham W. Smith

*Charlotte B. Smith
*George A. Snell

O. Phillip Snowden
*Bernard Solomon

Robert C. Sprague
Milton Stern

David B. Stone
*Ruth S. Stuart

H. Patricia Taylor
Lawrence I. Templeman

Charles H. Tenney II
Almore I. Thompson

Milton A. Thompson
W. Nicholas Thorndike

Alan D. Tobin
*D. Thomas Trigg

Paul E. Tsongas
Joseph F. Turley

†Chaplin Tyler

Samuel Wakeman
*Martin F. Walsh

*An Wang

Lloyd B. Waring
James L. Waters

David T. Wendell
William C. White

*Robert H. Willis

Richard W. Young

**Alvin C. Zises

Officers of the Corporation and Board of Trustees

Robert H. Willis, Chairman

Norman L. Cahners, Vice
Chairman

Frank L. Farwell, Vice
Chairman

Farnham W. Smith, Vice
Chairman

D. Thomas Trigg, Vice
Chairman—Finance

Philip C. Boyd, Secretary
Byron K. Elliott, Honorary

Chairman

William R. Driver, Jr.,
Honorary Vice Chairman

Dwight P. Robinson, Jr.,
Honorary Vice Chairman

Board of Trustees

Class of 1983

Vincent Barletta

Roy H. Beaton

Louis W. Cabot

Byron K. Elliott

Kenneth A. Loftman

John Lowell

Roderick M. MacDougall

Augustin H. Parker

Francis J. Quirico

Charlotte B. Smith
An Wang

Class of 1984

Thomas E. Cargill, Jr.

Eldred L. Field

Robert L. Johnson

George S. Kariotis

Diane H. Lupean

Amelia Peabody

Thomas L. Phillips

William J. Pruyn

Dorothy M. Simon

Bernard Solomon

Robert H. Willis

Class of 1985

Norman L. Cahners

Richard P. Chapman

William Elfers

William P. Ellison

James V. Fetchero

Ernest Henderson III

Carl R. Hurtig

John P. LaWare

George J. Matthews

Ruth S. Stuart

Class of 1986

Frederick L. Brown

Frank L. Farwell

Lloyd S. Glidden, Jr.

Allan M. Hale

Henry C. Jones

Farnham W. Smith

George A. Snell

D. Thomas Trigg

Martin F. Walsh

Ex Officio

††Kenneth G. Ryder

Honorary Trustees

Diana J. Auger

William R. Driver, Jr.

Donald B. Guy

Lawrence H. Martin

Donald W. Smith

Alvin C. Zises

Lifetime Trustees, Emeriti

F. Gregg Bemis

David H. Cogan

Frances Kenerson

Asa S. Knowles

Dwight P. Robinson, Jr.

Chaplin Tyler

*Member of the Board of Trustees

**Honorary Trustee

†Lifetime Trustee, Emeritus

††President of the University

Administrative Organization

Officers of the University

John A. Curry, A.B., Ed.M., Ed.D., *Senior Vice President for Administration*

Edmund L. Deltano, B.A., *Vice President for Finance*

Asa S. Knowles, A.B. A.M., LL.D., Litt.D., Sc.D., D.B.A., Sc.D. in Bus. Ed., *Chancellor*

Melvin Mark, B.S., M.S., Sc.D., *Senior Vice President for Academic Affairs and Provost*

John A. Martin, B.S., M.B.A., *Vice President for Business*

John D. O'Bryant, B.S., M.Ed., *Vice President for Student Affairs*

Eugene M. Reppucci, Jr., B.S., M.Ed., *Vice President for University Development*

Daniel J. Roberts, B.S., M.B.A., Ed.M., *Senior Vice President-Treasurer*

Kenneth G. Ryder, A.B., M.A., L.H.D., *President*

Royal K. Toebes, B.S., M.B.A., *Vice President for Alumni Development*

Roy L. Wooldridge, B.S., Ed.M., *Vice President for Cooperative Education*

Academic Deans, Directors of Schools, and General Administrative Officers

Richard Astro, B.A., M.A., Ph.D., *Dean of the College of Arts and Sciences*

Maryann G. Billington, A.B., M.B.A., *Assistant Dean and Director of the Graduate School of Business Administration*

Philip T. Crotty, A.B., A.M., M.B.A., Ed.D., *Vice Provost*

Martin J. Damian, B.S., *Bursar*

Charles Devlin, B.S., M.Ed., *Dean of Student Financial Services*

Theodore N. Ferdinand, B.S., M.S., Ph.D., *Director of the Graduate Program in Criminal Justice*

Clifford J. Fralen, B.S., M.S.E., M.B.A., *Director of the Physical Plant*

William A. Frohlich, B.A., *Dean of University Publishing Group and Director of University Press*

Job E. Fuchs, M.D., *Director of Health Services*

Joseph M. Golemme, S.B., M.A., C.P.A., *Director of the Graduate School of Professional Accounting*

Thomas E. Hulbert, B.Mgt.E., M.S., *Director of Lincoln College and Associate Dean of Engineering*

Ellen S. Jackson, B.A., Ed.M., C.A.G.S., *Dean and Director of Affirmative Action*

John W. Jordan, B.S., M.Ed., *Dean of University College*

Paul M. Kalaghan, A.B., M.S., Ph.D., *Dean of the College of Computer Science*

Christopher F. Kennedy, A.B., Ed.M., *Dean of Administration*

Philip LaTorre, B.S., M.S., *Dean of Personnel Services and Director of Environmental Health*

Paul M. Lepley, B.S., M.Ed., Ed.D., *Dean of Boston-Bouvé College of Human Development Professions*

Juanita O. Long, B.S.N., M.S.N., C.A.G.S., Ed.D., *Dean of the College of Nursing*

Harold Lurie, B.S., M.S., Ph.D., *Dean of the College of Engineering*

Kathryn Luttgens, B.S., M.S., Ph.D., *Associate Provost*

Philip R. McCabe, B.A., M.Ed., *Dean of Admissions*

Philip R. McDonald, B.A., M.B.A., D.B.A., *Dean of the College of Business Administration*

Michael C. Meltsner, A.B., LL.B., *Dean of the School of Law*

Roland H. Moody, A.B., B.L.S., *Director of the University Libraries*

Edmund J. Mullen, B.A., M.Ed., *University Registrar*

J. Edward Neighbor, B.S., M.S., Ph.D., *Associate Dean of the College of Arts and Sciences and Director of the Graduate School*

John L. Neumeyer, B.S., Ph.D., *Director of the Graduate School of Pharmacy and Allied Health Professions*

Paul M. Pratt, B.S., M.Ed., *Dean of the Department of Cooperative Education*

John Proakis, B.S., M.S., Ph.D., *Director of the Graduate School of Engineering and Associate Dean of the College of Engineering*

Edward W. Robinson, B.S., Ed.M., *Dean of Students*

Norman Rosenblatt, A.B., Ph.D., *Dean of the College of Criminal Justice*

Jeanne L. Rowlands, B.A., B.S., M.A., *Director of Women's Athletics*

Gerald E. Schumacher, Pharm.D., M.Sc., Ph.D., *Dean of the College of Pharmacy and Allied Health Professions*

Arthur D. Smith, B.S., M.A., Ph.D., *Associate Provost*

Janice Walker, A.B., *Assistant Dean and Director of the Graduate School of Boston-Bouvé College of Human Development Professions*

Karl Weiss, B.S., Ph.D., *Vice Provost*

Joseph Zabilski, B.S., *Director of Men's Athletics*

General University Committees

Academic/Administrative Council†

Kenneth G. Ryder, Chairman
John A. Curry, Vice Chairman
Melvin Mark, Vice Chairman
Barbara F. Burke, Secretary

Richard Astro
Charles W. Coffin
Philip T. Crotty
Edmund L. Deltano
Clifford J. Fralen
Humberto F. Goncalves
Ellen S. Jackson
John W. Jordan
Paul M. Kalaghan
Christopher F. Kennedy
Roland E. Latham
Philip La Torre
Paul M. Lepley
Juanita O. Long
Harold Lurie
Kathryn Luttgens
John A. Martin
Philip R. McCabe
Philip R. McDonald
Michael C. Meltsner
Christopher Mosher
John D. O'Bryant
Donald G. Porter
Paul M. Pratt
Eugene M. Reppucci, Jr.
Daniel J. Roberts
Edward W. Robinson
Norman Rosenblatt
Gerald E. Schumacher
Arthur D. Smith
Royal K. Toebes
Karl Weiss
Raymond R. Williams
Roy L. Wooldridge

Faculty Senate

*Melvin Mark, Presiding Officer
George G. Adams
*Richard Astro
Samuel J. Bernstein
Franklyn K. Brown
Leslie A. Burg
Richard L. Canale
Holly M. Carter
Sangit Chatterjee
*John A. Curry
Elisabeth M. Drake
Charles H. Ellis, Jr.
Mary Florentine
Edith E. Flynn
Marvin H. Friedman
Norbert L. Fullington
Bart K. Gruzalski
Robert J. Hehre
Irwin L. Herrnsstadt
Jorge V. Jose
*Paul M. Kalaghan
Margaret E. Leahy
Lila S. Leibowitz
*Juanita O. Long
*Harold Lurie
Bertram J. Malenka
*Philip R. McDonald
Robert A. Millen
Stuart S. Peterfreund
Harlan D. Platt
*Paul M. Pratt
Richard Rasala
Donald J. Reaves
*Norman Rosenblatt
Robert A. Schatz
*Gerald E. Schumacher
Walter C. Schwab
Pamela A. Stanton
Nancy Walden
Robert N. Wiener

*Appointed by the President

†Two faculty representatives to be selected by the Faculty Senate Agenda Committee.

Burlington Campus
Bedford Road

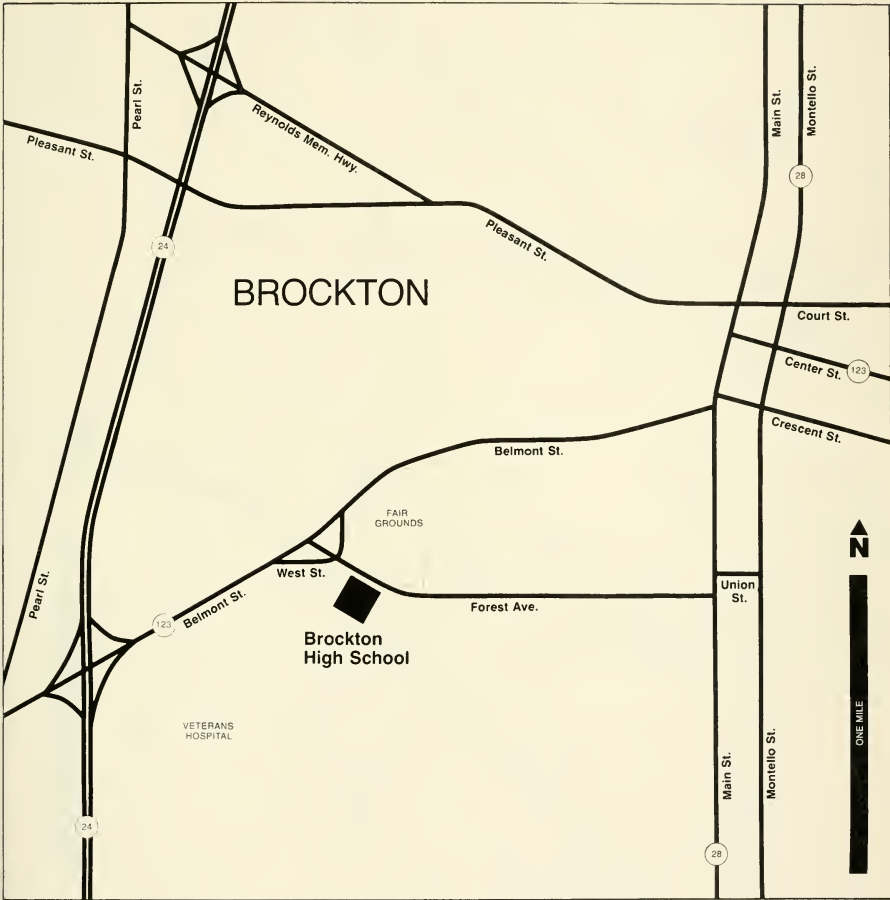
Burlington High School
Cambridge Road



Belmont High School
Concord Avenue



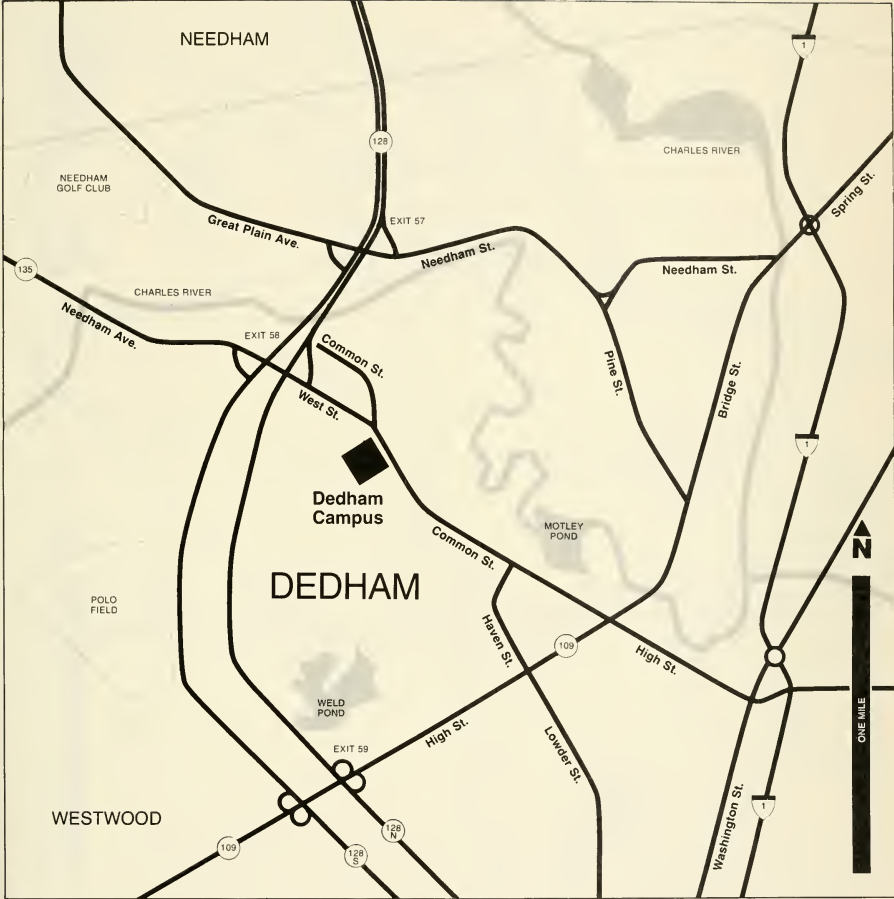
**Brockton High School
Forest Avenue**



Chelmsford High School
Richardson Road



Dedham Campus
Common Street



Framingham North High School
A Street



Lynnfield Middle School
Main Street



Marlborough High School
Bolton Street



Marshfield High School
Furnace Street



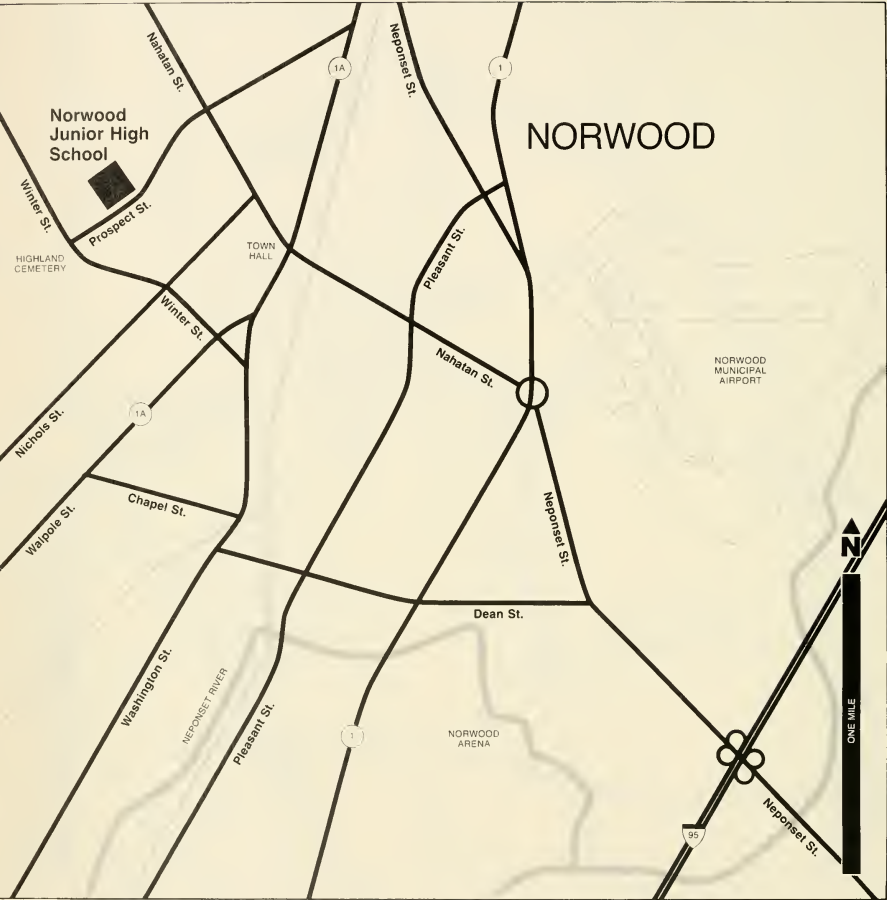
Milford High School
West Fountain Street



North Attleboro High School
Landry Avenue



Norwood Junior High School North
Prospect Street



Revere (Abraham Lincoln School)
Tuckerman Street



Westwood High School
Nahatan Street



Weymouth North High School
Commercial Street



Index

A

Absence, 32
Academic advisers, 26, 34
Academic and Student Affairs, Office of, 25
Academic calendar, 6–8
Academic counseling, 34
Academic policies, 26–33
 changes in, 2
Accounting
 course descriptions, 184–85
 curricula in, 51, 63, 133
 Graduate School of, 13
Accreditation, 2
Activities, extracurricular, 43–44
Address changes, 32
Administrative officers, 22, 238–39
Admission, 26
Admissions Office, 10
Advanced Standing Credit Petition, 29, 30–31
Advertising
 course descriptions, 179, 185, 186
 curriculum in, 131
Advisers, 26, 34
Affirmative Action Office, 2
Allied health professions; *see also*
 Pharmacy and Allied Health Professions, College of
 certificate programs in, 117, 123, 127, 130
 course descriptions, 204–09
 degree programs in, 110–30
Alternative Freshman-Year Program, 11
Alumni association, 43
American sign language
 course descriptions, 177–78
 curriculum in, 132
Anatomy, course descriptions, 146, 147
Anthropology
 course descriptions, 150–51
 curricula in, 85–87
Arabic, courses in, 176
Architecture, course descriptions, 164
Arena, 20
Arts, course descriptions, 162–66
Arts and Sciences
 certificate programs in, 131–33
 College of, 10, 56
 curriculum in, 79
 degree programs in, 67–91
 Graduate School of, 12
 major in, 79
 research in, 14
Attendance, 32
Auditing, 27
 fees for, 37

Awards

Professional Promise, 43
of scholarships, 39–40, 41

B

Biological technology, curricula in, 89–91
Biology, course descriptions, 146–48
Boston-Bouvé College of Human Development Professions
 course description, 202
 graduate program, 12
 research in, 14
 undergraduate program, 10
Buildings
 Boston campus, 4, 17–19
 suburban campuses, 19–20, 241–55
 Burlington campus, 19, 241
Bursar's Office, 37
Business administration; *see also*
 Management
 certificate programs in, 47, 133–35
 course descriptions, 184–202
 degree programs in, 47–65
 graduate college of, 12
 major in, 50
 minor in, 50, 67–68
 research in, 15
 undergraduate college of, 10

C

Cabot Physical Education Center, 19, 43
Calendar, academic, 6–8
Campuses
 Boston, 4, 17–19
 office hours at, 5–6
 suburban, 19–20, 241–55
Cancellation, of classes
 due to inadequate enrollment, 27
 due to inclement weather, 2
Career counseling, 34–36
Career development, courses in, 35, 210
Career placement services, 36
Certificate programs, 131
 in arts and sciences, 131–33
 in business administration, 47, 133–35
 in computer systems specialist program, 135–37
 in cytotechnology, 123
 in dental assistant program, 130
 in health/medical record administration, 117
 in law enforcement, 135–37

in therapeutic recreation, 127–29

Certification requirements, 2

Chemical Analysis, Applications, and Forensic Science, Institute of, 15

Chemical-biological technology, curricula in, 89–91

Chemistry

 course descriptions, 142–44
 research in, 15

CLEP examinations, 29, 30, 48

Clinical assignments, 109, 118

Clubs, 43

College-Level Examination Program, 29, 30, 48

Commencement

 ceremony, 33

 Data Card, 29

 date for, 8

 fee, 38

Communication; *see also* Writing
 graphic, 132, 165–66
 speech, 133, 178–79
 technical, 59

Community education, 13

Community health management
 concentration in, 114

 course descriptions, 204–206

Computer programming

 course descriptions, 196–99

 curriculum in, 133

Computer Science, College of, 10

Computer systems specialist program, 139

Continuing Education, Center for, 13

Cooperative Education Research Center, 15

Cooperative (co-op) program, 9, 35

Core career courses, 35, 210

Correctional practices

 course descriptions, 210–18

 curricula in, 96–99, 136

Counseling

 academic, 34, 36

 career, 34–36

 personal, 36

 and Testing Center, 19, 36

Courses

 changes in, 2, 27, 93

 intensive, 183–84, 201–03, 217–18

 noncollegiate, 30, 69, 93–4

 at other institutions, 29, 30

 selection of, 26

 sequential, 48

 substitution of, 28

 waivers for, 28

- Credit
by examination, 29, 30
for extrainstitutional learning, 30–31
for noncollegiate experience, 30, 69, 93–94
transfer, 28, 29, 30
- Criminal justice
course descriptions, 210–18
curriculum in, 136
graduate school of, 12
research in, 14
undergraduate school of, 10
- Curricula, changes in, 33
Curriculum committees, 23
- Cytotechnology
course descriptions, 209
curriculum in, 123
- D**
- Data processing, course descriptions, 196–99
- Dean's list, 32
- Dedham campus, 19, 245
- Degree candidate, 27
- Degree programs, 45–46
in arts and sciences, 67–91
in business administration, 47–65
credit toward, 26
in health professions, 109–130
in law enforcement, 93–107
- Dental assistant program
course descriptions, 205
curricula in, 130
length of, 11, 21
- Directed study
in arts and sciences, 70
in law enforcement, 93
- Disabled students and employees, 2
- Disciplinary action, 32–33
- Discrimination, 2
- Distribution management
course descriptions, 194–95
curriculum in, 61, 135
- Dockser Hall, 19
- E**
- Earth science, course descriptions, 144–46
- Ecology, course descriptions, 144, 146, 148
- Economics
course descriptions, 180–82
curricula in, 70–71
- Education, Institute for the Interdisciplinary Study of, 15
- Electron Microscopy, Center for, 15
- Ell Student Center, 17
fee for, 38
- Emergency closing, 2
- Employer, payment of tuition by, 37
- Engineering, College of
graduate program, 13
research in, 14
undergraduate program, 10
- English
course descriptions, 171–75
curricula in, 72–73
writing sample for, 26
- Equal opportunity policy, 2
- "Events" telephone line, 19
- Examinations, 32
final, 7, 8, 32, 38
make-up, 32
for validation, 29–30, 48
- Extracurricular activities, 43–44
- F**
- Facilities, 17–20
- Faculty, 21, 219–35
- Family Educational Rights and Privacy Act, 2, 32
- Fees, 37, 38
changes in, 2
- Fieldwork courses
in arts and sciences, 69
in health professions, 109, 118
in law enforcement, 94
- Film, courses in, 171, 173
- Final examinations
dates for, 7, 8
missed, 32, 38
- Finance
course descriptions, 187–88
curricula in, 53, 134
- Financial aid, 40–42
- Fine arts
course descriptions, 162–65
curricula in, 76
- Foreign students, 26–27, 30
- Fraternities, 43
- French, course descriptions, 175
- Freshman year, alternative program for, 11
- G**
- German, courses in, 176
- Government
course descriptions, 154–57, 180, 181, 182
curricula in, 80–82
- Grade point average, 27, 31
- Grade reports, 31
- Grading system, 31–32
- Graduate schools
information on, 36
programs, 12–13
- Graduation
ceremony, 33
Commencement Data Card, 29
date for, 8
fee for, 38
with honor, 28
requirements for, 28
- Grants, 41
- Graphic design and communication
course descriptions, 165–66
curriculum in, 132
- Gymnasiums, 16, 43
- H**
- Handicapped, Office of Services for, 2
- Hayden Lodge, 20
- Health management
course descriptions, 204–06
curriculum in, 113–14
- Health professions; see also Pharmacy and Allied Health Professions, College of
certificate programs in, 117, 123, 127, 130
course descriptions, 204–09
degree programs in, 110–30
program directors and coordinators, 109–10
- Health record administration
certificate program in, 117
course descriptions, 206–07
degree program in, 115–16
- Health science
course descriptions, 204–09
curriculum in, 110–12
- Hematology
course descriptions, 208–09
curriculum in, 121–22
- Henderson House, 20
- History
course descriptions, 157–60
curricula in, 77–78
- Holidays, 6–8
- Homework, 32
- Honor society, 43
- Honors, 28, 32
- Honors programs
in arts and sciences curriculum, 68–69
in law enforcement, 93
- Hotel management
course descriptions, 193–94
curricula in, 54, 134
- Human resources management
course descriptions, 200–01
curricula in, 55, 134
- Human services concentration, 87
- I**
- In absentia status, 28
- Inclement weather, 2
make-up period for, 7
- Incomplete, 31
- Independent study
in arts and sciences, 68
in law enforcement, 93
- Industrial management
course descriptions, 190–92
curriculum in, 56
- Industrial technology, curriculum in, 62
- Insurance Institute, 13
- Intensive courses, single-quarter
in arts and sciences, 183–84
in business administration, 46, 201–02
in law enforcement, 217–18
- International students, 26–27, 30

Internships, 36; *see also* Clinical assignments; Cooperative (co-op) program in management, 12
 Italian, course descriptions, 176–77

J

Japanese, course descriptions, 176
 Job counseling, 34–36
 Jobs
 co-op, 9, 34–36
 after graduation, 2, 35, 36
 Journalism, course descriptions, 179–80

L

Laboratory fees, 38
 Laboratory science
 course descriptions, 208–09
 curricula in, 118–23
 Lambda Alpha Epsilon, 43
 Languages; *see* English; Modern languages; Sign language
 Law
 course descriptions, 195–96
 research in, 14
 School of, 13
 Law enforcement
 certificate programs in, 135–37
 course descriptions, 210–17
 curricula in, 100–103
 degree programs in, 93–107
 intensive courses in, 217–18
 Learning Resources, Office of, 19
 Liability, for services, 2
 Libraries, 18
 Library science, course descriptions, 182–83
 Lincoln College, 10
 Linguistics, course descriptions, 150, 172, 177
 Literature
 concentration in, 72
 course descriptions, 173–75
 Loans, 41–42
 Long-term care administration
 concentrations in, 114
 course descriptions, 206, 207
 Loss prevention, curriculum in, 137

M

Management; *see also* Business administration
 course descriptions, 188–92
 curriculum in, 64
 Management Development Program, 12
 Management Information Systems
 course descriptions, 196–99
 curricula in, 57, 65
 Management Workshops, 12
 Maps
 of Boston campus, 4
 of suburban campuses, 241–55

Marine Science and Maritime Center, 14, 20
 Marketing
 course descriptions, 185–87
 curricula in, 58, 134
 Mathematics
 course descriptions, 141–42
 placement test in, 26
 Matriculation, 27–28; *see also* Graduation
 Matthews Arena, 20
 MBA program, 12
 Medical laboratory science
 course descriptions, 208–09
 curricula in, 118–23
 Medical laboratory technician
 course descriptions, 208–09
 curriculum for, 119
 Medical record administration
 certificate program in, 117
 course descriptions, 206–07
 degree program in, 116
 Medical technologist, curriculum for, 120
 Minorities
 discrimination against, 2
 scholarships for, 39
 MIS
 course descriptions, 196–99
 curricula in, 57, 65
 Modern languages
 course descriptions, 175–77
 proficiency examination for, 30
 Music
 course descriptions, 166–70
 curricula in, 88
 fee for individualized instruction in, 38

N

New students, open houses for, 34
 Noncollegiate experience credit, 30
 in arts and sciences, 69
 in law enforcement, 93–94
 Nondegree students, 26; *see also* Auditing
 Northeastern University, 9
 directions to, 17
 Notary public, 19
 Nursing, School of, 10
 research in, 14

O

Office hours, 5
 Open houses, for new students, 34

P

Pass/fail courses, 27, 32
 PEP examinations, 29, 30, 48
 Personnel management
 course descriptions, 200–01
 curricula in, 55, 134
 Pharmacology, course descriptions, 204, 206, 207

Pharmacy and Allied Health Professions, College of
 graduate program, 13
 research in, 14
 undergraduate program, 11
 Philosophy, course descriptions, 160–62
 Photography, course descriptions, 166, 179
 Physical distribution management
 course descriptions, 194–95
 curricula in, 61, 135
 Physical Education Center, 19, 43
 Physics, course descriptions, 142
 Physiology, course descriptions, 147, 148
 Placement services, 36
 in computer systems, 139
 Placement tests, 26; *see also* PEP examinations
 Policies, 26–31
 changes in, 2
 Political science
 course descriptions, 154–57
 curricula in, 80–82
 Prerequisites, 26
 Probation, 32–33
 Professional Promise awards, 43
 Proficiency Examination Program, 29, 30, 48
 Programs of study, 45–46, 131
 in arts and sciences, 67–91, 131–33
 in business administration, 47–65, 133–35
 in computer systems, 139
 in health professions, 109–30
 in law enforcement, 93–107, 135–37
 Psychology
 course descriptions, 148–50
 curricula in, 83–84
 Public administration concentration, 82
 Public relations
 course descriptions, 179–80, 186
 curriculum in, 131
 Publishing, course descriptions, 165–66, 172
 Purchasing
 course descriptions, 192
 curricula in, 59, 135

Q

Quality control, course descriptions, 199–200
 Quality point average, 28, 31

R

Radiologic technology program
 course descriptions, 207–08
 curricula in, 124–25
 length of, 11, 21
 Real estate
 course descriptions, 192–93
 curriculum in, 60

Records, inspection of, 2, 32
 Recreation, therapeutic
 course descriptions, 202–04
 curricula in, 126–29
 Recruiting, 36
 Registration
 dates for, 6–8
 fee for, 37
 procedure for, 26
 Rehabilitation
 curricula in, 126–29
 Rehabilitation Act, 2
 Religion, course descriptions,
 160–62
 Relocation, 28
 Requirements, changes in, 33
 Research, 13–15
 Residence requirement, 28
 Restaurant management
 course descriptions, 193–94
 curricula in, 54, 134

S

Schedule, 6–8
 changes in, 2, 26, 27
 Scholarships, 39–40
 Security
 course descriptions, 212–13,
 216, 218
 curricula in, 95, 104–07, 137
 Self-assessment, courses in, 35,
 210
 Senior status, 28–29
 Sexual harassment, 2
 Sigma Epsilon Rho honor society,
 43
 Sign language
 course descriptions, 177–78
 curriculum in, 132
 Snow cancellation, 2
 make-up period for, 7
 Social problems, curriculum in,
 136
 Social Research, Center for Ap-
 plied, 15
 Social welfare, course descrip-
 tions, 154

Sociology
 course descriptions, 151–54
 curricula in, 85–87
 Spanish
 course descriptions, 175–76
 Speech communication
 course descriptions, 178–79
 curriculum in, 133
 Sports
 arena, 20
 gymnasium, 19, 43
 Statistics, course descriptions,
 142, 148–49, 180, 181
 Student activities, 43–44
 Student body, 22
 Student Center, 17
 fee for, 38
 Student Handbook, 32
 Student loans, 40–42
 Study skills workshops, 36
 Suburban campuses, 19–20, 241–
 55
 Summer quarter
 calendar for, 8
 office hours, 5–6
 Swedish
 course descriptions, 176
 Swimming pool, 19, 43
 Systems analysis, curriculum in,
 133

T

Technical Communications, curric-
 ulum in, 74–75
 Technology programs, 68
 Telephone numbers, for University
 College offices, 5
 Theatre arts, course descriptions,
 170–71
 Therapeutic recreation services
 course descriptions, 202–04
 curricula in, 126–129
 Title IX Coordinator, 2
 Transcripts, 26, 31, 38
 fee for, 38
 Transfer credit, 28, 29–30

Transportation, to Boston campus,
 17
 Transportation management
 course descriptions, 194–95
 curricula in, 61, 135
 Travel program, 44
 Tuition, 37–38
 changes in, 2
 financial aid for, 40–42
 scholarships for, 39–40, 41
 Tutorial services, 34

U

Undergraduate colleges, 10–11
 University College, 11, 21–23

V

Validation, of required courses,
 29–30, 48
 Veterans' benefits, 37
 Visitor Information Center, 19
 Vocational counseling, 36

W

Waivers, 28; *see also* Validation,
 of required courses
 Warren Center, 20
 Weather, closing on account of, 2
 make-up period for, 7
 Withdrawal, 27
 and refund of tuition, 37–38
 Women
 core career courses for, 35, 210
 discrimination against, 2
 in Engineering, 13
 scholarships for, 39, 40
 Work-study program; *see* Cooper-
 ative (co-op) program
 Writing; *see also* Communication
 creative, 68
 course descriptions, 171–73
 professional, 132
 sample of, 26
 software technical, 132–133
 technical, 172–173

Northeastern University

**Basic Day Colleges
Course Descriptions
and Curriculum Guide**



Northeastern University

1983-1984

Basic Day Colleges Course Descriptions and Curriculum Guide

College of Arts and Sciences
Boston-Bouvé College of Human
Development Professions
College of Business Administration
College of Computer Science
College of Criminal Justice
College of Engineering
Lincoln College
College of Nursing
College of Pharmacy and
Allied Health Professions
University College Alternative
Freshman-Year Program

Northeastern University charges tuition for all courses taken above the normal academic load.

The University reserves the right to make changes in the regulations and courses announced in this bulletin.

Northeastern University Publishing Group

5.31.3

Contents

Curriculum Guide 1983-1984

College of Arts and Sciences	1
Boston-Bouvé College of Human Development Professions	18
College of Business Administration	31
College of Computer Science	34
College of Criminal Justice	37
College of Engineering	38
Lincoln College	47
College of Nursing	50
College of Pharmacy and Allied Health Professions	51
University College Alternative Freshman-Year Program	57
The Writing Center	57
Basic College Compensatory Programs	59
Course Descriptions	60
Academic Calendar	237

Delivery of Services

The University assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements, and acts of public authorities. The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities, or performance, but its inability or failure to do so shall not subject it to liability.

Northeastern University reserves the right in its sole judgment to promulgate and change rules and regulations and to make changes of any nature in its program, calendar, admissions policies, procedures and standards, degree requirements, fees, and academic schedule whenever it is deemed necessary or desirable, including, without limitation, changes in course content, the re-scheduling of classes, cancelling of scheduled classes and other academic activities, and requiring or affording alternatives for scheduled classes or other academic activities. In any such case giving such notice as is reasonably practicable under the circumstances.

Equal Opportunity Policy

Northeastern University is committed to a policy of equal opportunity for all students and employees without regard to race, color, religion, sex, sexual preference, age, national origin, or handicap or veteran status. The University prohibits discrimination in all matters involving admission, registration, and all official relationships with students, including evaluation of academic performance. Northeastern is also an equal opportunity employer. The University also prohibits discrimination against any employee regarding upgrading, demotion, or transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training. In addition, the University adheres to affirmative action guidelines in the recruitment of students and employees.

Further, Northeastern will not condone any form of sexual harassment which is defined as the use of unwelcome sexual advances, requests for favors, and other verbal or physical conduct of a sexual nature as an explicit or implicit condition of admission or registration, as the basis for academic evaluation, or when such conduct interferes with an individual's work or classroom performance by creating an intimidating, hostile, or offensive work or classroom environment.

Inquiries concerning our equal opportunity policies may be referred to the University Affirmative Action Office, Room 175 Richards Hall, telephone: 617-437-2139 or 617-437-2133.

Accreditation Statement

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states. Accreditation by the Association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators.

Children's Center

Northeastern University operates a Children's Center in 123 Forsyth Building; the Center is academically housed in the Boston-Bouvé College of Human Development Professions' Department of Curriculum and Instruction. Children from age 2 years and 9 months to 6 years are eligible. For further information, phone 617-437-3929.

College of Arts and Sciences

The following models illustrate the kinds of curricula from which an upperclass student in the College of Arts and Sciences may select his/her program. Since the College offers programs leading to two degrees in most majors—the Bachelor of Arts and the Bachelor of Science—students should discuss their academic needs and goals with departmental faculty advisers and counselors in the College to determine the program most appropriate for them.

Generally, the Bachelor of Science requires greater concentration in the major field of study. Requirements for the Bachelor of Arts degree include minimum “distribution requirements” (courses in the humanities, social sciences, science/mathematics) and completion of a modern foreign language through the intermediate level.

Other programs available include an interdisciplinary major in Human Services, which is described in the University *Bulletin*, and an Independent major, whereby an eligible student may, with approval and guidance, design his/her own major. Information about these and all other programs is available in the Dean's Office.

Junior-Senior Honors Projects

Juniors and seniors who are members of the Honors Program or who have done superior work in their majors and have a high overall academic record are invited to apply to the Honors Committee to do special honors work during two or three of their last four quarters. Such work normally takes the form of a special research project, scheduled as a four-credit-hour course during each term in which it is pursued.

Eligibility

The College of Arts and Sciences has established these standards for junior-senior honors project eligibility:

Minimum of 3.50 cumulative GPA at Northeastern as of the time of application

No F's or I's

No C's or D's in major field.

Minimum of 32 credit hours of full-time enrollment at Northeastern.

Sometimes, with the approval of the major department and the Honors Committee, exceptions can be made. The Honors Committee automatically invites all students who are eligible to submit Honors Project proposals. The committee will also review applications from students who would normally not be eligible but who can provide good reason for special consideration. Requests for special consideration can be made by faculty members on behalf of students they deem to be serious and highly motivated scholars.

Honors Program Courses

Calculus for Honors Science Majors; Western Civilization; Freshman English for Honors Students; 93._____, _____, _____, Interdisciplinary Honors Seminars; 93.249, Honors Seminar: Survey of the Social Sciences; 93.250, Honors Seminar: Survey of the Natural Sciences; 93.251, Honors Seminar: Survey of the Humanities.

Adjunct Mini-Courses: Adjunct mini-courses meet for one hour per week with the instructor of a regular four-credit-hour course in which the students in the mini-course are concurrently or recently enrolled. The extra hour enables the honors students to explore the subject of the main course more thoroughly and in a small-group setting. Four mini-courses can count as a four-credit-hour elective toward graduation. The University allows students to register tuition free for one credit hour per quarter, so the adjunct mini-courses can in most cases be tuition free. The subjects of mini-courses are equitably distributed among departments. Ten to fifteen mini-courses are offered each year, three to five each term. Course numbers and a schedule of mini-courses for the school year are available from the Honors Program Office.

African-American Studies

Bachelor of Arts Bachelor of Science

African-American Studies majors may study for either the Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) degree. All majors are required to take the following courses:

- 25.237 African-American History I
- 25.201 African-American Literature I
- 25.210 Contemporary Issues in Black Society
- 25.269 Race Relations in America
- 25.170 Economic Issues in Minority Communities
- 25.255 Public Policy Analysis
- 25.212 The Black Family
- 25.191 Research Seminar
- 25.195 Directed Study for Senior Thesis
- 25.194 Field Research Seminar for Seniors

Faculty advisers work with students to help them select electives within their chosen area of concentration to fulfill their distribution and language requirements for the degree of Bachelor of Arts or career package programs for the degree of Bachelor of Science.

Minor in African-American Studies

Required Courses: 25.269, Race Relations in America; 25.191, Research Seminar; and 25.200, Introduction to African-American Studies.

Elective/Concentration Clusters: Any four courses in African-American Studies of an advanced nature, to be selected by the student and department adviser in line with the student's education and career needs. For example, a student interested in health careers might select as minor electives Black Scientific Development, Community Medicine and Health Care, the Epidemiology of Black Diseases, and Poverty and Health Care.

Art And Architecture

Bachelor of Arts

27.118, 27.119, History of Art to 1400 and History of Art since 1400; twelve art electives; two history electives; one music elective; and one philosophy elective.

Foreign language and distribution requirements.

Bachelor of Science

27.118, 27.119, History of Art to 1400 and History of Art since 1400; twelve art electives; two history electives; one music elective; and one philosophy elective.

Minors in Art

History of Architecture: 27.177, Introduction to Architecture; 27.205, Introduction to Architectural Design; 27.201, Architecture and the City; 27.161, American Architecture; 27.178, Technology, Architecture, and the City; 27.176, Contemporary Architecture and the City.

History of Painting: 27.000, (still to be determined); 27.139, Medieval Art and Architecture; 27.191, Renaissance Art and Architecture; 27.137, French Painting; 27.162, American Sculpture and Painting.

Film and Photography: 27.121, Contemporary Directions in Cinema; 27.163, The American Film; 27.190, Filmmaking Workshop; 27.189, Basic Photography I; 27.202, Basic Photography II; 27.199, Intermediate Photography Workshop.

General Minor: Selection of any six courses from the department curriculum.

Biology

Bachelor of Arts

18.111, Principles of Biology I; 18.112, Principles of Biology II; 18.113 Vertebrate Systems, Bio III; 18.134, Environmental and Population Biology; 18.135, Genetics and Developmental Biology; 18.136, Cell Physiology and Biochemistry (formerly called Biology); four biology electives approved by department Advisory Committee.

Fundamentals of Mathematics or Calculus (one year); 11.171, 11.172, Physics for the Life Sciences I and II; 11.173, 11.174, Physics Laboratory for the Life Sciences I and II, or 11.117, Physics for Science Majors I; 11.119, Physics for Science Majors III; 11.147, 11.149, Physics Laboratory for Science Majors I and III; 12.106, General Chemistry; 12.119, General Chemistry II; 12.171, Analytical Chemistry; 12.144, 12.145, Organic Chemistry I and II.

Foreign language and distribution requirements.

Bachelor of Science

18.111, Principles of Biology I; 18.112, Principles of Biology II; 18.113, Vertebrate Systems, Bio III; 18.134, Environmental and Population Biology; 18.135, Genetics and Developmental Biology; 18.136, Cell Physiology and Biochemistry; 18.280, Senior Seminar; four biology electives approved by department Advisory Committee.

Calculus (one year); 11.117, 11.118, 11.119, Physics for Science Majors I, II and III; 11.147 and 11.148, Physics Laboratory for Science Majors I and II, or 11.149, Physics Laboratory for Science Majors III; 12.106, General Chemistry I; 12.119, General Chemistry II; 12.171, Analytical Chemistry; 12.144, 12.145, Organic Chemistry I and II; two approved science electives.

Foreign language requirement.

Chemistry

Bachelor of Arts

12.127, 12.128, General Chemistry I and II; 12.129, The Chemical Elements; 12.172, Analytical Chemistry; 12.153, 12.154, 12.155, Organic Chemistry I, II, and III; 12.161, 12.162, 12.168, Physical Chemistry I, II, and III; 10.184, Calculus and Linear Methods I, or 10.153, Calculus; 12.179, Instrumental Analysis.

10.181, 10.182, 10.183, Calculus I, II, and III; 11.117, 11.118, 11.119, Physics for Science Majors I, II, and III; 11.148, 11.149, Physics Laboratory for Science Majors II and III.

Foreign language and distribution requirements.

Bachelor of Science

12.127, 12.128, General Chemistry I and II; 12.129, The Chemical Elements; 12.172, Analytical Chemistry; 12.153, 12.154, 12.155, Organic Chemistry I, II, and III; 12.161, 12.162, 12.168, Physical Chemistry I, II, and III; 10.184, Calculus and Linear Methods I, or 10.153, Calculus; 12.179, Instrumental Analysis; 12.213, Inorganic Chemistry; 12.532, Identification of Organic Compounds; two advanced science or mathematics electives; one advanced laboratory.

10.181, 10.182, 10.183, Calculus I, II, and III; 10.186, Differential Equations and Linear Methods I, or 10.156, Mathematical Analysis; 11.117, 11.118, 11.119, Physics for Science Majors I, II, and III; 11.148, 11.149, Physics Laboratory for Science Majors II and III.

Minor in Chemistry

After a general chemistry sequence, 12.172, Analytical Chemistry; 12.153, 12.154, 12.155, Organic Chemistry I, II, III; 12.161, 12.162, Physical Chemistry I, II.

Drama

Bachelor of Arts

The following courses are to be taken by students in their freshman year: 29.121, Theatre Appreciation; 29.122, Theatre Experience. (Those students entering the major after their freshman year may waive the requirements of 29.121 and 29.122 by successfully completing a departmental examination.)

After his/her freshman year, the student selects one of three specializations—acting and directing, technical theatre, or playwriting/dramatic criticism/theatre history—and enrolls in the courses required for the particular concentration selected:

Acting and Directing: 29.109, Speech for the Theatre; 29.110, Voice and Articulation; 29.111, Oral Interpretation; 29.130, Stage Makeup; 29.151, Acting II; 29.156, Body Movement I; 29.161, Problems in Direction.

Technical Theatre: 29.130, Stage Makeup; 29.172, Set Design for the Stage; 29.173, Lighting Design for the Stage; 29.175, Costuming I; 29.176, Costuming II; 29.178, Theatre Crafts.

Playwriting/Dramatic Criticism/Theatre History: 29.111, Oral Interpretation; 29.161, Problems in Direction; 29.172, Set Design for the Stage; 29.180, Playwriting I; 29.181, Playwriting II; 29.107, New Trends in American Theatre.

In addition, all Drama majors must complete the following courses: 29.150, Acting I; 29.160, Concepts of Direction; 29.170, Stagecraft; 29.200, Theatre History I; 29.201, Theatre History II; 29.218, Research for Theatrical Production; 29.240, Dramatic Theory/Criticism; 29.164, 29.165, 29.166, and 29.167, Theatre Practicum; and 29.280, Senior Project in Drama.

Eight quarter hours psychology or four quarter hours each anthropology and sociology.

Foreign language and distribution requirements.

In addition, the Department recommends that a physical education skills course be selected each quarter.

Bachelor of Science

The following courses are to be taken by students in their freshman year: 29.121, Theatre Appreciation; 29.122, Theatre Experience. (Those students entering the major after their freshman year may waive the requirements of 29.121 and 29.122 by successfully completing a departmental examination.)

After his/her freshman year, the student selects one of three specializations—acting and directing, technical theatre, or playwriting/dramatic criticism/theatre history—and enrolls in the courses required for the particular concentration selected:

Acting and Directing: 29.109, Speech for the Theatre; 29.110, Voice and Articulation; 29.111, Oral Interpretation; 29.130, Stage Makeup; 29.151, Acting II; 29.156, Body Movement I; 29.161, Problems in Direction.

Technical Theatre: 29.130, Stage Makeup; 29.172, Set Design for the Stage; 29.173, Lighting Design for the Stage; 29.175, Costuming I; 29.176, Costuming II; 29.178, Theatre Crafts.

Playwriting/Dramatic Criticism/Theatre History: 29.111, Oral Interpretation; 29.161, Problems in Direction; 29.172, Set Design for the Stage; 29.180, Playwriting I; 29.181, Playwriting II; 29.207, New Trends in American Theatre.

In addition, all Drama majors must complete the following courses: 29.150, Acting I; 29.160, Concepts of Direction; 29.170, Stagecraft; 29.200, Theatre History I; 29.201, Theatre History II; 29.218, Research for Theatrical Production; 29.240, Dramatic Theory/Criticism; 29.164, 29.165, 29.166, and 29.167, Theatre Practicum; and 29.280, Senior Project in Drama.

In addition, the Department recommends that a physical education skills course be selected each quarter.

Minor in Drama

Required of all minors: 29.121, Theatre Appreciation, and 29.122, Theatre Experience.

Six additional courses must be taken in one of the three tracks, including:

Performance: 29.150, Acting I; 29.160, Concepts of Direction; 29.156, Body Movement I; 29.159, Theatre Games; 29.185, Children's Theatre.

Technical Theatre/Design: 29.170, Stagecraft; 29.172, Scene Design; 29.173, Lighting Design for the Stage; 29.175, Costuming I; 29.270, Theatre Management.

Drama Literature and Criticism: 29.200, History of the Theatre I; 29.201, History of the Theatre II; 29.180, Playwriting; 29.232, Comic Theatre; 93.160, American Musical Theatre; 29.140, Drama Criticism.

Economics**Bachelor of Arts**

39.115, 39.116, Principles and Problems of Economics I and II; 39.250, 39.251, Statistics I and II; 39.255, Microeconomic Theory; 39.256, Macroeconomic Theory; six economics electives.

10.104, 10.105, Fundamentals of Mathematics I and II; four social science electives other than economics.

Foreign language and distribution requirements.

Bachelor of Science

39.115, 39.116, Principles and Problems of Economics I and II; 39.250, 39.251, Statistics I and II; 39.255, Microeconomic Theory; 39.256, Macroeconomic Theory; 39.293, Introduction to Econometrics, or 39.294, Problems in Economic Research; ten economics electives.

10.104, 10.105, Fundamentals of Mathematics I and II; four social science electives other than economics.

Minor in Economics

39.115, 39.116, Principles and Problems of Economics I and II; 39.255, Microeconomic Theory; 39.256, Macroeconomic Theory; four electives in economics. Electives to be selected with the advice of a department adviser. Any course taken outside the Department of Economics to satisfy these economics elective requirements must be approved by a faculty adviser in the Department.

English**Bachelor of Arts**

30.170, 30.171, Survey of English Literature I and II; 30.180 or 30.181, Survey of American Literature I or II; one British literature course; one American literature course; one figure course; one genre course; one language and writing course; one junior-senior seminar; four English electives.

Foreign language and distribution requirements.

Bachelor of Science

30.170, 30.171, Survey of English Literature I and II; 30.180 or 30.181, Survey of American Literature I or II; one British literature course; one American literature course; one figure course; one genre course; one language or writing course; one junior-senior seminar; four English electives.

Minor in Literature

Distribution requirements as required for the Bachelor of Arts program. *Six courses required.* Two survey courses required from the following: 30.170, Survey of English Literature I; 30.171, Survey of English Literature II; 30.180, Survey of American Literature I; 30.181, Survey of American Literature II. One course each from two of the following categories: (a) language or writing (e.g., History of the English Language, linguistics,

semantics, criticism, creative writing, expository writing); (b) British literature; (c) American literature; (d) major figure; or (e) genre. One elective. Junior-senior seminar.

Minor in Writing

Six courses required. Four courses from among the following writing courses: 30.104, Intermediate Expository Writing; 30.108, Creative Writing; 30.228, Nonfiction Workshop; 30.200, Technical Writing I; 30.201, Technical Writing II; 30.203, Writing for the Professions: Health Services; 30.204, Advanced Expository Writing; 30.205, Writing for the Professions: Business Administration; 30.206, Freshman Technical Writing; 30.207, Writing for the Professions: Criminal Justice; 30.208, Poetry Workshop; 30.209, Fiction Workshop; 30.215, Publication Arts. Two elective courses (if the student desires, one or both of the electives may be selected from the writing courses listed above).

Sample Programs: (a) 30.108, Creative Writing; 30.228, Nonfiction Workshop; 30.209, Fiction Workshop; 30.208, Poetry Workshop; 30.154, Modern Short Story; 30.167, Literature and Politics; (b) 30.104, Intermediate Expository Writing; 30.200, Technical Writing I; 30.201, Technical Writing II; 30.204, Advanced Expository Writing; 30.215, Publication Arts; 30.168, Literature and Science.

Geology

Bachelor of Arts

16.201, Physical Geology; 16.203, Physical Geology Laboratory; 16.202, Historical Geology; 16.204, Historical Geology Laboratory; 16.215, Descriptive Mineralogy; 16.217, Optical Crystallography; 16.218, Petrography; 16.271, Geology Seminar; six geology electives.

10.104, 10.105, Fundamentals of Mathematics I and II, or 10.105, 10.107, Calculus I and II; 11.117, Physics for Science Majors I, or 11.171, Physics for the Life Sciences I; 12.106, General Chemistry I; 12.119, General Chemistry II.

Foreign language and distribution requirements.

Bachelor of Science

16.201, Physical Geology; 16.203, Physical Geology Laboratory; 16.202, Historical Geology; 16.204, Historical Geology Laboratory; 16.206, Rock Identification Laboratory; 16.215, Descriptive Mineralogy; 16.217, Optical Crystallography; 16.218, Petrography.

10.105, 10.107, Calculus I and II, or 10.150, 10.151, 10.152, Calculus I, II, and III; 11.117, 11.118, 11.119, Physics for Science Majors I, II, and III; 12.106, 12.119, or 12.127, 12.128, General Chemistry I and II; 12.172 or 12.171, Analytical Chemistry, or 12.161, Physical Chemistry, or 16.214, Geochemistry; two approved additional science electives; six courses in the humanities and/or social sciences; 16.271, Senior Seminar; eight geology electives.

Minor in Geology

16.201, Physical Geology; 16.202, Historical Geology; 16.215, Descriptive Mineralogy; plus two of the following one-credit laboratories: 16.203, Physical Geology Laboratory; 16.204, Historical Geology Laboratory; 16.206, Rock Identification Laboratory; plus four geology electives (16.214 or higher number) chosen with the approval of the Earth Science Department.

History

Bachelor of Arts

23.101, 23.102, Western Civilization I and II; 23.210, 23.211, United States to 1877 and United States since 1877; 23.199, The Historian's Craft; ten history electives distributed as follows; two courses in Group A (ancient, medieval, early modern Europe); two courses in Group B (modern

Europe); two courses in Group C (America); two courses in Group D (other regions); two courses in any of the above groups.

Foreign language and distribution requirements.

Recommended: courses in the related social sciences.

Bachelor of Science

23.101, 23.102, Western Civilization I and II; 23.210, 23.211, United States to 1877 and United States since 1877; 23.199, The Historian's Craft; 23.200, Social Science Methodology; twelve history electives distributed as follows: two courses in Group A (ancient, medieval, early modern Europe); two courses in Group B (modern Europe); two courses in Group C (America); two courses in Group D (other regions); four courses in any of the above groups.

One course in Introductory Statistics (e.g., 19.120, 21.239, 39.250). One course in computers from the following: 10.108, Probability, Statistics, and the Computer; 10.130, Introduction to Computers and Computations; 93.113, Computers for the Social Sciences. Three of the following: 39.115, Principles of Economics; 21.100, Introduction to Sociology; 20.100, Principles of Social Anthropology; 22.110, Introduction to Politics; 19.105, Foundations of Psychology; 18.119, Environment and Man. (Substitutions only with approval of the Department Chairperson.)

Minor in History

Thirty-two quarter hours of history, of which eight quarter hours must be selected from the following: 23.101, Western Civilization I; 23.102, Western Civilization II; 23.210, United States to 1877; 23.211, United States since 1877.

Human Services

Bachelor of Arts

Prerequisite Courses (six): 21.100, Introduction to Sociology, or 50.114, Education and Social Science; 50.166, The Human Services Professions; 19.105 and 19.106, Foundations of Psychology I and II, or 50.121 and 50.131, Human Development and Learning I and II; 22.111, Introduction to American Government; 39.115 or 39.116, Principles and Problems of Economics or equivalent.

Core Courses (nine): 19.120, Statistics in Behavioral Science I, or 21.239, Introduction to Statistical Analysis or 50.142, Introduction to Educational Statistics; 19.160, Experimental Design in Psychology, or 21.240, Research Methods I, or 21.243, Human Services Research and Evaluation, or 22.120, Conceptual Foundations of Contemporary Political Analysis; 21.157, Sociology of Human Services Organizations; 19.135, Personality I; 19.202, Abnormal Psychology I; 50.167, Education and Psychosocial Development; 29.141, Interpersonal Communications II, or 29.117, Group Discussion, or 50.133, Educational Applications of Social Psychology, or 50.161, Seminar in Group Process; 53.266, Intervention Strategies; 93.232, Senior Seminar.

Specified Electives (any three courses): 21.112, Sociology of Poverty; 21.125, The Sociology of Private and Public Assistance; 21.221, Seminar in Social Welfare; 22.160, The Politics of Poverty; 39.278, Income Inequalities and Discrimination; 25.210, Contemporary Issues in Black Society; 25.224, Black Cultural Development in the United States; 25.279, Minorities, Ethnicity, and Human Rights; 50.164, Class and Ethnic Relations in Education; 56.120, Introduction to Special Education.

Specializations (five courses in any one specialization): Specializations are individually constructed by the student and his/her adviser. Alternatives are grouped in three broad clusters: Clinical, Community, and Administration.

Fieldwork: 93.230, Human Services Fieldwork I; 93.231, Human Services Fieldwork II.

Interdisciplinary

Independent Major

An eligible student may petition the College Curriculum Committee to meet requirements for the B.A. degree in an Independent major. Eligibility, procedures, and requirements must be discussed in advance with an adviser in the Dean's Office. No student may be considered an Independent major until a curriculum proposal has been submitted to, and approved by, the Curriculum Committee.

Minor in Media Studies

To qualify for a minor in Media Studies, the student must complete a minimum of seven courses distributed as follows: Required Courses (two): 29.127, *The Mass and the Media*; and 29.119, *Communication Theory*, or 29.133, *Theories of Audience Behavior*, or 93.145, *Exploring Humanities through Film*. One elective course from each of the following categories (total of five): Media and Culture (appreciation and criticism), Media Studies (historical and structural aspects), Media Production, and two additional electives from any of the three categories above or interdisciplinary course choices subject to adviser approval. Individual student programs will be developed in consultation with faculty advisers. Interested students should contact Professor Herman (History Department) for information on program development and elective choices.

Minor in Urban Studies

Students must take 28 quarter hours (seven courses) as follows: *Required Courses* (three): 21.145, *Urban Society*; 22.143, *Urban Politics*; 39.268, *Urban Economics*. One course from each of the following four areas: *Urban Problems and Policies* (21.146, *Suburb and Metropolis*; 22.141, *State and Local Government*; 39.269, *Urban Economic Problems and Policies*), *Urban Humanities* (23.176, *European Urban History to 1850*; 23.213, *American Urban History*; 30.166, *The City in Literature*), *Urban Form and Design* (27.201, *Architecture and the City*; 27.178, *Technology, Architecture, and the City*; 27.205, *Introduction to Architectural Design*), *African-American Studies* (25.136, *Economics of Urban Poverty*; 25.233, *Urban Political Issues*; 25.255, *Public Policy Analysis*).

To obtain credit for the minor, students must file a petition form with the College of Arts and Sciences at the time of senior clearance. Petition forms may be obtained at the College office or from advisers for the program. Interested students should confer with an adviser as soon as possible. Advisers are: Professor Robert Gilbert, Political Science (303 ME, ext. 2796); Professor Ronald McAllister, Soc./Anthro. (500 HO, ext. 2686); Professor Clay McShane, History (203 ME, ext. 2660); Professor Peter Serenyi, Art (401 UO, ext. 2346); Professor Joseph Warren, African-American (426 UO, ext. 3148); Professor Gregory Wassell, Economics (339 HO, ext. 2196).

Journalism

Bachelor of Arts Bachelor of Science

Each major will complete the journalism core and one of four concentrations—Newspaper/Print, Radio-Television News, Advertising, or Public Relations—to correspond with his/her career objective.

Journalism Core: 38.101, *History of Journalism*; 38.102, *Journalism Ethics and Issues*; 38.103, *Newswriting I*; 38.104, *Newswriting II*; 38.106, *Editing*; 38.108, *Law of the Press*; 38.201, *Photojournalism*.

Newspaper/Print Concentration: 38.105, *Techniques of Journalism*; 38.132, *Local Government Reporting*; 38.140, *Design and Graphics*; 38.175, *Publication Production and Management*; one journalism elective.

Radio-Television News Concentration: 38.120, *Radio News Gathering and Writing*; 38.121, *Television Newswriting*; 38.122, *Television News Production*; 38.290, *Directed Study*; one journalism elective.

Public Relations Concentration: 38.136, Public Relations Principles; 38.140, Design and Graphics; 38.160, Public Relations Problems; 38.161, Public Relations Practice; one journalism elective.

Advertising Concentration: 38.140, Design and Graphics; 38.150, Advertising Principles; 38.151, Advertising Copy Writing; 38.152, Advertising Practice; one journalism elective.

Each major will complete the following related requirements:

30.103, Grammar for Journalists; 30.113, Freshman English I; 30.114, English II; 30.170, Survey of English Literature I; and two courses from this list: 30.171, Survey of English Literature II; 30.180, Survey of American Literature I; 30.181, Survey of American Literature II.

22.111, Introduction to American Government; 22.141, State and Local Government; 23.210, United States to 1877; 23.211, United States since 1877; 39.115, Principles of Economics, and one additional course in economics or business; 37.271, Introduction to Communication Research, or the equivalent; 26.150, Introduction to Logic I; 26.131, Social and Political Philosophy; 23.101, Western Civilization I; 23.102, Western Civilization II; 90.135, Professional Development for Journalists.

Introduction to Art, Drama, and Music or one course from each of the following categories—(a): 27.152, Introduction to Art and Architecture; 27.197, Art and Society; 27.119, History of Art II; 27.162, American Sculpture and Painting; (b): 28.100, Music I; 28.120, Survey of Music History; 28.250, Music as a Listening Experience; 29.121, Theater Appreciation.

Bachelor of Arts

In addition to the journalism and related requirements above, candidates for the Bachelor of Arts degree will complete four courses in science and/or math and will complete a modern language through the college intermediate level.

Bachelor of Science

In addition to the journalism and related requirements above, candidates for the Bachelor of Science degree will complete six courses in science and/or math.

Linguistics

Bachelor of Arts

Freshman Requirements: 30.113, Freshman English I; 30.114, English II; mathematics course; two courses from the humanities; two from the sciences; and two from the social sciences.

Distribution Requirements: One or more additional science courses and two or more additional humanities courses for a total of five additional courses in science and humanities. (Some of these requirements can be met by fulfilling the general requirements and additional course requirements in the major.)

General Requirements: 30.120, Introduction to Linguistics; 19.155, Introduction to Language and Cognition; 19.152, Introduction to Phonetics and Phonology; 20.130, Language and Culture (or an advanced course in same area); 30.125, Grammars of English; 33.235, Applied Linguistics, or 33.236, Advanced Applied Linguistics.

Language Proficiency: Two advanced courses in a spoken second language (see Bachelor of Sciences for proficiency in American Sign Language).

Additional Courses: Five courses from the following: 19.151, Bilingualism; 19.153, Child Language; 19.154, Linguistics of American Sign Language; 19.157, Cognition; 19.182, Neurolinguistics; 19.235, Animal Communication; 19.247, Body Language; 26.127, Philosophy of Language; 26.151, Symbolic Logic; 30.121, Foundations of the English Language; 30.126, Transformational Grammar; 30.130, Introduction to

Semantics; 30.131, Topics in Linguistics; 33.236, Advanced Applied Linguistics; 33.237, Language Testing.

Laboratory Course: 19.195, Laboratory in the Psychology of Language.

Seminars: Two of the following: 19.272, Seminar in the Psychology of Language; 19.277, Seminar in Speech and Language Processing; 30.280, Seminar in Stylistics.

Practicum: One course: fieldwork, directed study, sign language teaching, or interpreting.

Bachelor of Science

Same requirements as the Bachelor of Arts, except that American Sign Language can count toward the second-language proficiency requirement.

Mathematics

Bachelor of Arts

10.181, 10.182, 10.183, Calculus I, II, and III; 10.184, 10.185, Calculus and Linear Methods I and II; 10.186, 10.187, Differential Equations and Linear Methods I and II; 10.246, Linear Algebra; 10.250, Analysis I; four approved mathematics electives selected in consultation with an adviser.

11.117, 11.118, 11.119, Physics for Science Majors I, II, and III.

Foreign language and distribution requirements.

Bachelor of Science

10.181, 10.182, 10.183, Calculus I, II, and III; 10.184, 10.185, Calculus and Linear Methods I and II; 10.186, 10.187, Differential Equations and Linear Methods I and II; 10.246, Linear Algebra; 10.250, Analysis I; seven approved mathematics electives selected in consultation with an adviser.

11.117, 11.118, 11.119, Physics for Science Majors I, II, and III; two non-science courses.

Bachelor of Science in Computer Science

The Bachelor of Science degree in Computer Science is conferred jointly with the College of Engineering (Department of Industrial Engineering).

The general course requirements, for a total of 179 quarter hours, are: Twenty-four quarter hours of calculus-based mathematics, including 10.150-10.153, Calculus; 10.210, Discrete Mathematics; 10.246, Linear Algebra. Eight quarter hours of calculus-based probability and statistics (10.208 and 10.220).

Twenty quarter hours in algorithms and programming, including both assembly languages and high-level languages (06.100 and 06.101, PASCAL I and PASCAL II; 09.130, Applied Programming; 06.130, 06.131, Assembly Language I and II).

Twelve quarter hours in physics (or, in special cases, chemistry or biology).

Thirty-six quarter hours of social science/humanities, English, and professional writing.

Forty quarter hours of computer science, including 06.220, File Structures; 06.201, Data Structures; 06.265, Analysis of Algorithms; 06.240, Programming Languages; 06.230, Operating Systems; 06.260, Compilers; 06.250, Automata and Formal Language; 06.291, Project; and 06.295, Seminar.

Eight quarter hours of computer design and organization (03.191 and 03.192).

Twenty-eight quarter hours of student-selected coordinated studies.

Three quarter hours of Programming Language Laboratory (06.110, 06.111, and 06.112).

Minor in Computer Science *Required Courses:* 10.130, Introduction to Computers and Computa-

tions; 10.131, Introduction to Computer Sciences; 10.214 or 06.130, Assembly Language; 10.215 or 06.201, Data Structures.

Electives: Three advanced mathematics or computer science courses, which must have to be approved by the department.

Modern Languages

Bachelor of Arts

Eight advanced electives in the major language,* two advanced electives in the minor language.*

30.170, 30.171, Survey of English Literature I and II; 23.101, 23.102, Western Civilization I and II; two additional history electives.

Distribution requirements.

Bachelor of Science

Twelve advanced electives in the major language,* including two conversation and composition courses; six advanced electives in the minor language,* including two conversation and composition courses.

23.101, 23.102, Western Civilization I and II.

*Courses beyond the intermediate level.

Philosophy

Bachelor of Arts

26.110, Ancient Philosophy; 26.111, Modern Philosophy; 26.150, Introduction to Logic I, or 26.151, Symbolic Logic; 26.152, Theory of Knowledge, or 26.153, Metaphysics, or 26.155, Moral Philosophy; one philosophy seminar; eight philosophy electives.

Foreign language and distribution requirements.

Bachelor of Science

26.110, Ancient Philosophy; 26.111, Modern Philosophy; 26.150, Introduction to Logic I, or 26.151, Symbolic Logic; 26.152, Theory of Knowledge, or 26.153, Metaphysics, or 26.155, Moral Philosophy; one philosophy seminar; eight philosophy electives.

Minor in Philosophy

To qualify for a minor in philosophy, a student must take 28 quarter hours in philosophy. These will be distributed as follows:

Introductory Courses: 26.101, Introduction to Philosophy I, or 26.102, Introduction to Philosophy II, or 26.105, Introduction to Scientific Method. *History of Philosophy:* 26.110, Ancient Philosophy, or 26.111, Modern Philosophy. *Logic Requirement:* 26.150, Introduction to Logic I, or 26.151, Symbolic Logic. At least one of the following courses: 12.125, Philosophy of Mind; 26.152, Theory of Knowledge; 26.153, Metaphysics; 26.155, Moral Philosophy. *Electives:* Three electives in Philosophy.

Physics

Bachelor of Arts

11.117, 11.118, 11.119, Physics for Science Majors I, II, and III, and their associated laboratories—11.147, 11.148, 11.149; 11.127, Intermediate Mechanics; 11.128, Electric and Magnetic Fields; three upper-level physics lecture courses; three upper-level physics laboratory courses.

10.181, 10.182, 10.183, Calculus I, II, and III; 10.184, 10.185, Calculus and Linear Methods I and II; one advanced mathematics elective.

Foreign language and distribution requirements.

Bachelor of Science

11.117, 11.118, 11.119, Physics for Science Majors, I, II, and III, and their associated laboratories—11.147, 11.148, 11.149; 11.127, Intermediate

Mechanics; 11.128, Electric and Magnetic Fields; 11.208, Mathematical Physics; 11.220, Thermodynamics and Kinetic Theory; 11.221, Wave Motion and Optics; 11.230, Modern Physics; 11.200, Classical Mechanics; 11.211, 11.212, Electricity and Magnetism I and II; three upper-level physics laboratory courses.

10.181, 10.182, 10.183, Calculus I, II, and III; 10.184, 10.185, Calculus and Linear Methods I and II; 10.186, 10.187, Differential Equations and Linear Methods I and II; five additional electives from those approved for majors in the following fields: physics, mathematics, chemistry, engineering, biology, and geology.

Minor in Physics

11.117, 11.118, 11.119, Physics for Science Majors I, II, and III or 11.203, 11.204, 11.205, 11.206, Physics for Engineering students I, II, III, and IV; *and* three upper level lecture or laboratory courses from the following list: 11.127, 11.128, 11.182, 11.200, 11.208, 11.211, 11.212, 11.220, 11.221, 11.230, 11.240, 11.241, 11.246, 11.247, 11.260; 11.272, 11.282, 11.285.

Instrumentation for Sciences Minor

11.117, 11.118, 11.119, Physics for Science Majors I, II, and III or 11.203, 11.204, 11.205, Physics for Engineering Students I, II, and III.

11.260, Wave Laboratory; 11.246, 11.247, Electronics for Scientists I and II; 11.273, Advanced Laboratory.

Political Science

Bachelor of Arts

22.110, Introduction to Politics; 22.111, Introduction to American Government; 22.112, Introduction to International Relations; 22.113, Introduction to Foreign Governments and Societies (formerly Introduction to Comparative Politics); 22.261, Public Administration; one political theory/thought course selected from the following: 22.270, 22.273, 22.274; seven political science electives.

Six social science electives selected from at least three of the following areas: African-American studies, anthropology, economics, history, psychology, and sociology.

Foreign language and distribution requirements.

Bachelor of Science

22.110, Introduction to Politics; 22.111, Introduction to American Government; 22.112, Introduction to International Relations; 22.113, Introduction to Foreign Governments and Societies (formerly Introduction to Comparative Politics); *22.121, Research Methods I; *22.122, Research Methods II; 22.261, Public Administration; and one political theory/thought course selected from the following: 22.270, 22.273, 22.274; six political science electives.

Six social science electives selected from at least three of the following areas: African-American studies, anthropology, economics, history, psychology, and sociology.

Minor in Political Science

Any two of the following courses: 22.110, Introduction to Politics; 22.111, Introduction to American Government; 22.112, Introduction to International Relations; 22.113, Introduction to Foreign Governments and Societies; 22.261, Public Administration. Any five additional courses offered by the Department of Political Science for Political Science majors, including courses listed above that have not been selected to fulfill the above requirement.

Concentration in Public Administration

Bachelor of Science

22.110, Introduction to Politics; 22.111, Introduction to American Government; 22.121, Research Methods I; 22.122, Research Methods II; 22.260, Public Policy Analysis; 22.261, Public Administration; 22.266,

* 22.121 and 22.122 replace 22.280, 22.281, and 22.286.

Public Personnel Administration; 22.267, Public Budgeting; 22.262, Organization Theory; and one political theory/thought course selected from the following: 22.270, 22.273, 22.274; four public administration electives.

Six social science electives selected from at least three of the following areas: African-American studies, anthropology, economics, history, psychology, and sociology.

Psychology

Bachelor of Arts

General Requirements: Freshman requirements (see note 1); Arts and Sciences distribution requirements; Foreign Language requirements; 23.101, Western Civilization I, or 23.102, Western Civilization II; 19.105 and 19.106, Foundations of Psychology I and II; 19.120 and 19.121, Statistics in Behavioral Sciences I and II; 19.130, Social Psychology, or 19.135, Personality I; 19.149, Sensation, or 19.150, Perception; 19.155, Language and Cognition; 19.164, Learning and Motivation I; and 19.178, Physiological Bases of Psychology I.

Students choose either General Psychology or one of four areas of concentration: Language and Cognition; Learning and Behavior Analysis; Personality and Social Psychology; or Sensory and Neuropsychology. The additional courses required for each concentration follow:

General psychology: four psychology electives (see note 2); three psychology laboratories; and one psychology seminar.

Language and Cognition: 19.151, Bilingualism; 19.152, Introduction to Phonetics; two psychology electives (see note 2); 19.195, Laboratory in Psycholinguistics; 19.290, Directed Study in Language and Cognition; one additional psychology laboratory; and 19.271, Seminar in Cognition, or 19.272, Seminar in the Psychology of Language.

Learning and Behavior Analysis: 19.168, Behavior Change in Institutions; 19.169, Learning and Motivation II; one of the PSI Teaching Practica, 19.250-19.268 (even numbered); one of the Advanced PSI Teaching Practica, 19.251-19.269 (odd numbered); 19.165, Learning and Motivation Laboratory; 19.171, Behavior Modification Laboratory; one additional psychology laboratory; and one seminar, either 19.166, Introduction to Programmed Learning; 19.270, Seminar in Behavior Theory; or 19.276, Seminar in Behavior Modification.

Personality and Social Psychology: 19.130, Social Psychology, or 19.135, Personality I (see note 3); 19.136, Personality II; 21.107, Social Psychology (see note 4); two additional courses selected from the following: 20.151, Aggression (see note 4); 20.160, Sex, Sex Roles, and Family (see note 4); 21.151, Sociology of Prejudice (see note 4); 29.115, Theories of Persuasion (see note 4). Also, 19.133, Laboratory in Social Psychology, or 19.138, Laboratory in Personality; two additional psychology laboratories; and one seminar, either 19.275, Seminar in Social Psychology; 19.273, Seminar in Clinical Psychology and Personality; or 21.207, Seminar in Social Psychology (see note 4).

Sensory and Neuropsychology: 19.149, Sensation, or 19.150, Perception (see note 3); 19.179, Physiological Bases of Psychology II; 19.180, Seminar in Neuropsychology; 19.183, Biological Bases of Motivation, or 19.186, Comparative Psychology and Ethology; 19.162, Sensation and Perception Laboratory; 19.181, Laboratory in Neuropsychology; one additional psychology laboratory; and 19.274, Seminar in Sensory and Physiological Psychology.

General Requirements: Freshman requirements (see note 1); 23.101, Western Civilization I, or 23.102, Western Civilization II; three additional courses in mathematics, physics, chemistry, or biology, including at

Bachelor of Science

least one from 11.171 and 11.173, Physics for the Life Sciences I and Laboratory; 12.106, General Chemistry, or 18.131, General Biology. Also, 19.105 and 19.106, Foundations of Psychology I and II; 19.120 and 19.121, Statistics in Behavioral Sciences I and II; 19.130, Social Psychology, or 19.135, Personality I; 19.149, Sensation, or 19.150, Perception; 19.155, Language and Cognition; 19.164, Learning and Motivation I; and 19.178, Physiological Bases of Psychology.

Students choose either General Psychology or one of four areas of concentration: Language and Cognition; Learning and Behavior Analysis; Personality and Social Psychology; or Sensory and Neuropsychology. The additional courses required for each concentration follow:

General Psychology: six psychology electives (see note 2); four psychology laboratories; one psychology seminar; and one Directed Study or Honors Research, from 19.290 to 19.299.

Language and Cognition: 19.151, Bilingualism; 19.152, Introduction to Phonetics; 30.120, Introduction to Linguistics (see note 4); three psychology electives (see note 2); 19.195, Laboratory in Psycholinguistics; 19.290, Directed Study in Language and Cognition; two additional psychology laboratories; 19.271, Seminar in Cognition, or 19.272, Seminar in the Psychology of Language; and one Directed Study or Honors Research, from 19.291 to 19.299.

Learning and Behavior Analysis: 19.168, Behavior Change in Institutions; 19.169, Learning and Motivation II; one of the PSI Teaching Practica, 19.250-19.268 (even numbered); one of the Advanced PSI Teaching Practica, 19.251-19.269 (odd numbered); two psychology electives (see note 2); 19.165, Learning and Motivation Laboratory; 19.171, Behavior Modification Laboratory; two additional psychology laboratories; one seminar; either 19.166, Introduction to Programmed Learning; 19.270, Seminar in Behavior Theory; or 19.276, Seminar in Behavior Modification; and one Directed Study or Honors Research, from 19.290 to 19.299 (see note 5).

Personality and Social Psychology: 19.130, Social Psychology, or 19.135, Personality I (see note 3); 19.136, Personality II; 19.186, Comparative Psychology and Ethology; 21.107, Social Psychology (see note 4); two additional courses selected from the following: 20.151, Aggression (see note 4); 20.160, Sex, Sex Roles, and Family (see note 4); 21.151, Sociology of Prejudice (see note 4); 29.115, Theories of Persuasion (see note 4). Also, 19.133, Laboratory in Social Psychology, or 19.138, Laboratory in Personality; three additional laboratories; one seminar, either 19.275, Seminar in Social Psychology; 19.273, Seminar in Clinical Psychology and Personality; or 21.107, Seminar in Social Psychology (see note 4); and one Directed Study or Honors Research, from 19.290 to 19.299 (see note 5).

Sensory and Neuropsychology: 19.149, Sensation, or 19.150, Perception (see note 3); 19.179, Physiological Bases of Psychology II; 19.180, Seminar in Neuropsychology; 19.183, Biological Bases of Motivation, or 19.186, Comparative Psychology and Ethology; two psychology electives; 19.162, Sensation and Perception Laboratory; 19.181, Laboratory in Neuropsychology; two additional psychology laboratories; 19.274, Seminar in Sensory and Physiological Psychology; and one Directed Study or Honors Research, from 19.290 to 19.299 (see note 5).

Minor in Psychology

General Requirements: 19.105, Foundations of Psychology I; 19.106, Foundations of Psychology II; 19.120, Statistics in Behavioral Science I; and 19.121, Statistics in Behavioral Science II.

Students choose either General Psychology or one of four areas of concentration: Language and Cognition; Learning and Behavior Analysis; Personality and Social Psychology; or Sensory and Neuropsychology. The additional courses required for each concentration follow:

General Psychology: 19.130, Social Psychology I, or 19.135, Personality; 19.149, Sensation, or 19.150, Perception; 19.155, Language and Cogni-

tion; 19.164, Learning and Motivation I; 19.178, Physiological Bases of Psychology I; and one psychology laboratory.

Language and Cognition: 19.155, Language and Cognition; 19.196, American Sign Language I; 19.151, Bilingualism; 19.152, Introduction to Phonetics; 19.156, Thought Processes in Children, or 19.157, Cognition; and 19.195, Laboratory in Psycholinguistics.

Learning and Behavior Analysis: 19.141, Human Behavioral Development I; 19.164, Learning and Motivation I; 19.149, Sensation; 19.168, Behavior Change in Institutions; one of the PSI Teaching Practica, 19.250-19.268 (even numbered); and 19.165, Learning and Motivation Laboratory.

Personality and Social Psychology: 19.130, Social Psychology; 19.135, Personality I; 19.136, Personality II; 19.202, Abnormal Psychology I; 19.203, Abnormal Psychology II; and 19.133, Laboratory in Social Psychology, or 19.138, Laboratory in Personality.

Sensory and Neuropsychology: 19.149, Sensation; 19.150, Perception; 19.178, Physiological Bases of Psychology I; 19.179, Physiological Bases of Psychology II, or 19.180, Neuropsychology; 19.183, Biological Bases of Motivation, or 19.186, Comparative Psychology and Ethology; and 19.162, Sensation and Perception Laboratory, or 19.181, Laboratory in Neuropsychology.

Notes:

1. All freshman enrolled in the College of Arts and Sciences must complete two quarters of Freshman English, one quarter of a college-level mathematics course, and two additional quarters from each of the areas of Humanities, Social Sciences, and Science. Courses taken to fulfill the freshman requirements may also be credited toward the Arts and Sciences distribution requirements for B.A. majors, as well as to relevant psychology major or minor requirements.
2. Courses in the Topics in Psychology Series (TIPS) will not be considered psychology electives, but will be considered free electives.
3. Whichever of these two courses was *not* taken to fulfill the basic psychology course requirement.
4. Credit for this course will be counted toward the psychology major only if the entire concentration is completed. If students change concentrations or decide to enroll in the General Psychology program, this course will be considered a free elective.
5. Students should arrange, well in advance of registration, for Directed Study or Honors Research with a faculty member whose laboratory focuses on the concentration area. For assistance in selecting potential sponsors, consult your adviser early in the preceding quarter.

Sociology-Anthropology Concentration in Sociology

Bachelor of Arts

Preparatory Requirements: 21.100, Introduction to Sociology, and 20.100, Introduction to Anthropology. *Core Requirements:* 21.139, Introduction to Statistical Analysis; 21.240, 21.241, Research Methods I and II; 21.280, Classical Social Thought; 21.281, Current Social Thought; 21.270, Class, Power and Social Change (preferably in senior year). *Elective Requirements:* two intermediate courses (100 level); two advanced courses (200 level); one anthropology course beyond 20.100.

Six electives in the social sciences other than sociology-anthropology. Foreign language and distribution requirements.

Bachelor of Science

Preparatory Requirements: 21.100, Introduction to Sociology and 20.100,

Introduction to Anthropology. *Core Requirements:* 21.239, Introduction to Statistical Analysis; 21.240, 21.241, Research Methods I and II; 21.280, Classical Social Thought; 21.281, Current Social Thought; 21.270, Class, Power, and Social Change (preferably in senior year). *Elective Requirements:* two intermediate courses (100 level); two advanced courses (200 level); one anthropology course beyond 20.100.

Six electives in the social sciences other than sociology-anthropology. Approved six-course specialization.

Minor in Sociology

Requirements: 21.100, Introduction to Sociology; any two courses from among the following: 21.240, Research Methods I; 21.241, Research Methods II; 21.280, Classical Social Thought; 21.281, Current Social thought; and any three-course specialization in sociology arranged between the student and adviser.

Concentration in Anthropology

Bachelor of Arts

Preparatory Requirements: 20.100, Introduction to Anthropology, and 21.100, Introduction to Sociology. *Core Requirements:* at least three of the following: 20.130, Language and Culture; 20.135, Individual and Culture; 20.240, Human Origins; 20.160, Sex, Sex Roles, and Family; 20.170, Culture in Transition; 20.210, Tribal Society and Cultures; 20.214, Peasant Society and Culture; 20.257, Myth and Religion. *Elective Requirements:* at least six additional anthropology courses; one sociology elective.

Six electives in the social sciences other than sociology-anthropology. Foreign language and distribution requirements.

Bachelor of Science

Preparatory Requirements: 20.100, Introduction to Anthropology, and 21.100, Introduction to Sociology. *Core Requirements:* at least three of the following: 20.130, Language and Culture; 20.135, Individual and Culture; 20.240, Human Origins; 20.160, Sex, Sex Roles, and Family; 20.170, Culture in Transition; 20.210, Tribal Society and Cultures; 20.214, Peasant Society and Culture; 20.257, Myth and Religion. *Elective Requirements:* at least six additional anthropology courses; one sociology elective.

Six electives in the social sciences other than sociology-anthropology. Approved five-course specialization.

Minor in Anthropology

Requirements: 20.100, Introduction to Social Anthropology; 20.130, Language and Culture; 20.135, Individual and Culture; 20.160, Sex, Sex Roles, and Family; and any two-course specialization in anthropology arranged between the student and adviser.

Speech Communication

Concentration in Group and Public Communication

Bachelor of Arts

Required Courses: 37.115, Introduction to Communication Skills; 37.131, Introduction to Communication Theory; 37.239, Argumentation and Debate, or 37.238, Group Discussion; 37.230, Interpersonal Communication I; 37.236, Theories of Persuasion, or 37.240, Contemporary Public Address; eight speech communication electives; 22.110, Introduction to Politics, or 22.111, Introduction to American Government; 19.106, Foundations of Psychology II, or 21.100, Introduction to Sociology; 19.130, Social Psychology, or 21.107, Social Psychology.

The College of Arts and Sciences foreign language and distribution requirements.

Bachelor of Science

Required Courses: 37.115, Introduction to Communication Skills; 37.131, Introduction to Communication Theory; 37.230, Interpersonal Com-

munication I; 37.238, Group Discussion; 37.236, Theories of Persuasion; 37.237, Persuasive Techniques; 37.271, Introduction to Communication Research; six speech communication electives to be chosen from the following: 37.239, Argumentation and Debate; 37.116, Business and Professional Speaking; 37.150, The Mass and the Media; 37.240, Contemporary Public Address; 37.241, Theories of Audience Behavior; 37.270, Consultation Skills; 37.231, Interpersonal Communication II; 37.232, Female/Male Communication; 30.120, Introduction to Linguistics; 30.130, Introduction to Semantics; 26.150, Introduction to Logic I. Also, eight social science credits beyond the introductory level, selected in consultation with the student's adviser and based upon their value to the student's post-graduate activities.

College of Arts and Sciences distribution requirements; no language requirement.

Concentration in Personal Performance

Bachelor of Arts

Required Courses: 37.115, Introduction to Communication Skills; 37.110, Voice and Articulation; 37.111, Oral Interpretation; 37.116, Business and Professional Speaking; 37.239, Argumentation and Debate; 37.212, Advanced Vocal Techniques or 37.214, Advanced Oral Interpretation; 37.290, Directed Study, six speech communication electives.

College of Arts and Sciences distribution and foreign language requirements.

Bachelor of Science

Required Courses: 37.115, Introduction to Communication Skills; 37.131, Introduction to Communication Theory; 37.110, Voice and Articulation; 37.111, Oral Interpretation; 37.290, Directed Study; eight speech communication electives selected from the following: 37.239, Argumentation and Debate; 37.116, Business and Professional Speaking; 37.212, Advanced Vocal Techniques; 37.214, Advanced Oral Interpretation; 37.236, Theories of Persuasion; 37.237, Persuasive Techniques; 37.238, Group Discussion; 37.244, Communication in Education; 37.150, The Mass and the Media; 37.240, Contemporary Public Address; 37.241, Theories of Audience Behavior; 37.270, Consultation Skills; 37.230, Interpersonal Communication I; 37.231, Interpersonal Communication II; 37.232, Female/Male Communication; 37.271, Introduction to Communication Research; 30.120, Introduction to Linguistics; 30.130, Introduction to Semantics; 26.150, Introduction to Logic I. In addition, the student must complete not less than four courses taught outside the Department, selected in consultation with his/her adviser on the basis of their value to the student's proposed post-graduate activities and approved by the Speech Communication Curriculum Committee.

College of Arts and Sciences distribution requirements; no language requirement.

Boston-Bouvé College of Human Development Professions

Specimen Program in Health Education

First Year

Quarter 1					Quarter 2					Quarter 3				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
12.111	Gen. Chem.	3	3	4	12.112	Gen. Chem.	3	3	4	10.104	Fund. Math.	4		4
30.113	Fresh. Eng. I	4		4	18.141	Bas. Ani. Bio.I	3	3	4	18.142	Bas. Ani. Bio.	3	4	4
50.114	Ed. & Soc. Sci.	4		4	65.110	Fnd. Hlth. Ed.	2		2	30.114	Fresh Eng. II	4		4
65.131	Current Iss.				65.160	Instrct. Res.	2		2	65.234	Hlth.Problems	4		4
	Hlth.	4		4	65.209	Intro. Safety	2		2		PE Elective			2
65.208	First Aid	2	1	2		Ed. Soc.								
	PE Elective			1		Elective			4					

Second Year

Quarter 4					Quarter 5				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
19.105	Psych. I	4		4	19.106	Psych. II	4		4
50.121	Hum. Devel. I	4		4	50.131	Human Devel. II	4		4
62.250	Anat.-Phys.	3	2	4	62.251	Anat.-Phys.	3	2	4
	Gen. Stud.				65.116	Nutrition	4		4
	Elective	4		4					

Third Year

Quarter 6					Quarter 7				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
18.120	Microbio.	3	4	4	50.141	Meas. & Eval.	4		4
51.135	Analysis of Tch.	4		4	65.222	Drug Use/Abuse	4		4
51.160	Pre-Practicum I.			1	65.225	Comm./Degen.			
65.114	Mental Hlth.	4		4		Diseases	4		4
	Require. Elect.	4		4		Gen. Stud.			
						Elective	4		4

Fourth Year

Quarter 8					Quarter 9				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
56.120	Intro. Spec. Ed.	4		4	65.140	Logvty. & Aging	4		4
65.217	Teach. Proced.	4		4	65.219	Comm. Hlth.	4		4
65.223	Hum. Sexuality	4		4	65.238	Seminar	2		2
	Gen. Stud.					Gen.Stud.			
	Elective	4		4		Elective	8		8
						Fnd. Ed. Elective	4		4

Fifth Year

Quarter 10					Quarter 11				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
65.240	Student Teach.			12	65.223	Org./Admin.			
	or					Hlth. Ed.	4		4
65.421	Field Exp.			12	65.235	Health Counseling	4		4
					65.239	Seminar	2		2
						Fnd. Ed. Elective	4		4

Specimen Program in Human Services

Quarter 1 22.111, Introduction to American Government; 30.113, Freshman English I; 50.114, Education and Social Science; designated elective.

Quarter 2 30.114, Freshman English II; 50.166, The Human Services Professions; 50.161, Seminar in Group Process; designated elective.

Quarter 3 39.116, Principles and Problems of Economics; designated electives.

Bachelor of Science *Required Courses:* 30.113, Freshman English I; 30.114, Freshman English II; 50.121, Human Development I; 50.131, Human Development and Learning II; 50.114, Education and Social Science; 22.111, Introduction to American Government; 39.116, Principles and Problems of Economics; 50.166, The Human Services Professions; 50.142, Introduction to Educational Statistics.

Core Courses: Either 19.135, Personality I, 19.136, Personality II, and 19.202, Abnormal Psychology, or 19.135, Personality I, 19.202, Abnormal Psychology I, and 19.203, Abnormal Psychology II; 50.167, Psychosocial Development; 50.161, Seminar in Group Process; 50.133, Educational Applications of Social Psychology; 21.157, Sociology of Human Service Organizations; 56.150, Introduction to Rehabilitation; 56.951, Principles of Medical Rehabilitation; one of the following: 21.145, Urban Society, or 21.245, Community Analysis, or 59.956, Community Planning in Rehabilitation; one of the following: 56.958, Social Welfare and Rehabilitation, or 21.125, Sociology of Private and Public Assistance, or 21.221, Seminar in Social Welfare; 53.804, Counseling Theory and Process.

Approved four-course concentration; two supervised field placements.

Courses in the areas of drama/speech and education humanities.

Distribution requirements.

Specimen Program in Physical Education

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
18.141	Bio. I	4	62.202	Life/Career Plan.*	3	10.104	Math.	4
30.113	Fresh. Eng. I	4	18.142	Bio. II or		62.206	First Aid*	2
50.114	Soc. Sci.	4	12.106	Chem. or		65.131	Hlth. Issues	4
62.200	Hum. Movt.*	3	11.171	Physics	4	62.205	Grp. Dynamics*	3
62.13V	Gymnastics I	1	30.114	Fresh. Eng. II	4	62.209	Hist./Phil. PE*	3
62.17J	Volleyball	1	50.121	Hum. Dev. I	4	62.16L	Track & Field	1
			62.13W/Y	Gymnastics II	1	62.10B	Swimming	3
			62.17C	Basketball	1			

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
62.250	Anat.-Physiology I*	4	62.253	Kinesiology I*	4
62.220	Motor Dev.	4	50.131	Hum. Devel. II	4
62.216	Elem. School Act. or		62.14C	Tennis	1
62.219	Sec. School Act.	3		Skill Elective	1
62.12P	Rhythmic Analysis	1		Elective	4
62.____	Skill Elective or			Elective	4
62.15A	Movement Ed.	1			
	Elective	4			

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
62.263	Kinesiology II	4	62.251	Anat.-Physiology II*	4
50.142	Ed. Stat.	4	62.222	Motor Learn.*	4
19.149,	Psych. Elective		62.260	Meas. and Eval.	4
or 105			62.217	Theory of Play or	
or 156		4	62.212	Theory of Coaching	2
or 157		4		TAC	2
62.276	Critical Teaching	4	62.16C	Condition. or	
	TAC	2	62.____	Skill Elective	1
62.14A	Badminton	1	62.____	Skill Elective	1

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
62.254	Exer. Physiology I*	4	62.280	Curriculum Devel.	3
62.255	Adapted PE I	4	62.256	Bas. Athletic Trng.	3
62.____	TAC	2		Elective	4
62.____	TAC	2		Elective	4
62.____	Skill Elective	1		Elective	2
	Elective	4			

Note: For an area of concentration or option within the Physical Education Dept., other courses will be required as replacements for some courses listed above.

Required Physical Education regardless of concentration.

Fifth Year

Quarter 10			Quarter 11		
No.	Course	Q.H.	No.	Course	Q.H.
62.282	Student Teaching	12	62.270	Admin.	4
				Elective	4
				Elective	4
				Elective	4

180 Q.H. = Minimum graduation requirement for Physical Education

185 Q.H. = Minimum graduation requirement for Athletic Training

Minimum of 24 Q.H. General Studies electives

Minimum of 9 Q.H. Boston-Bouvé College of Human Development Professions electives.

Specimen Program in Sport Communication (Nonteaching)

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
18.141	Bio. I	4	62.202	Life/Career Plan.	3	10.104	Math.	4
30.113	Fresh. Eng. I	4	18.142	Bio. II or		62.206	First Aid	2
50.114	Soc. Sci.	4	12.106	Chem. or		65.131	Current Iss. Hlth.	4
62.200	Hum. Movt.	3	11.171	Physics	4	62.205	Grp. Dynamics	3
62.13V	Gymnastics I	1	30.114	Fresh. Eng. II	4	62.209	Hlth./Phil. PE	3
62.17J	Volleyball	1	50.121	Hum. Dev. I	4	62.16L	Track & Field	1
			62.17C	Basketball	1	62.10B	Swimming	1
			62.13W/Y	Gymnastics II	1			

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
62.250	Anat.-Physiology I	4	62.253	Kinesiology I	4
62.220	Motor Dev.	4	50.131	Hum. Devel. II	4
38.103	News writ. I	4	38.104	News writ. II	4
37.236	Theories Persuasion	4	62.____	Ind. or Dual Skill	
62.____	Team Skill Elective	1		Elective	1
				Elective	4

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
62.263	Kinesiology II	4	62.251	Anat.-Physiology II	4
50.142	Ed. Stat.	4	62.222	Motor Learn.	4
19.149,	150, 156, 157, or 165 or		38.106	Tech. Journalism	4
	164 Psych. Elective	4		Elective	4
38.105	Tech. Journalism	4			

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
62.254	Exer. Physiology	4	62.256	Basic Athletic Trng.	3
62.255	Adapted PE I	4	62.217	Theory of Play	2
62.____	Coach/Officiate		62.212	Theory of Coaching	2
	Elective	2		Comm. Elective	4
	Elective	4		Electives	6
	Elective	4			

Fifth Year

Quarter 10			Quarter 11		
No.	Course	Q.H.	No.	Course	Q.H.
62.281	Practicum	12	62.270	Admin. of PE	4
			62.204	Psych. of Sport	2
			62.206	Soc. of Sport	2
				Elective	4
				Elective	4

180 Q.H. = Minimum graduation requirement for Physical Education Sport Communication

20 Q.H. = General Studies electives

9 Q.H. = Boston-Bouvé College of Human Development Professions electives

Note: Preregistration is essential for courses outside of the Physical Education Department.

Specimen Program in Recreation and Leisure Studies

First Year

Quarter 1				Quarter 2			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
37.106	Fund. of Speech	3	3	30.114	Fresh. Eng. II	4	4
30.113	Fresh. Eng. I	4	4	18.141	Anl. Bio. I	4(3)	4
50.114	Ed. Soc. Sci.	4	4	50.	Soc. Sci. Elec.	4	4
63.139	Life/Career Plan.	4	4	63.161	Found. Lead.		
63.124	Camp Leadership		2		Leis. Serv.	4	4

Quarter 3			
No.	Course	Cl.	Q.H.
65.131	Issues in Health	4	4
18.142	Anl. Bio. II	4(3)	4
50.____	Soc. Sci. Elect.	4	4
63.____	Prof. Skill Cluster	4	4

Second Year

Quarter 4					Quarter 5				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
50.121	Hum. Devel. I	4		4	50.131	Hum. Devel. II	4		4
62.250	Anat. Physio. I	3	2	4	62.251	Anat. Physio. II	3	2	4
16.____	Earth Sci. Elec.	4		4	16.____	Earth Sci. Elec.	4		4
63.148	Intro. to Rec. Leis.	3		3	63.____	Prof. Skill Cluster			4

Third Year

Quarter 6				Quarter 7			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
63.285	Intro. to Research	4	4	63.290	Research Seminar	4	4
63.____	Area of Concentration Course	4	4	63.165	Prog. Planning	4	4
63.____	Dept. Elective	4	4	63.____	Area of Concentration Course	4	4
	Guided Elective	3	4		Guided Elective		4

Fourth Year

Quarter 8				Quarter 9			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
63.250	Grp. Dynamics	3	3	63.280	Intern. Rec. Leis. Serv.		16
63.279	Intern. Seminar	1	1				
63.____	Area of Concen. Course	4	4				
63.____	Area of Concen. Course	4	4				

Fifth Year

Quarter 10				Quarter 11			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
63.____	Area of Concen. Course	4	4	63.299	Sr. Seminar In Cont. Issues	4	4
63.____	Dept. Elective	3	4	63.____	Area of Concen. Course	4	4
	Guided Elective		4		Guided Elective		4
	Guided Elective		4		Guided Elective		4

Specimen Program in Physical Education/Cardiovascular Health and Exercise Specialist (Nonteaching Certification)

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
18.141	Bio. I	4	62.202	Life/Career Plan.	3	10.104	Math.	4
30.113	Fresh Eng. I	4	18.142	Bio. II	4	62.206	First Aid	2
50.114	Soc. Sci.	4	30.114	Fresh. Eng. II	4	65.131	Current Iss. Hlth.	4
62.200	Hum. Movt.	3	50.121	Hum. Dev. I	4	62.203	Grp. Dynamics	3
62.13V	Gymnastics I	1	62.13W/Y	Gymnastics II	1	62.210	Hist./Phil. PE	3
62.17J	Volleyball	1	62.17C	Basketball	1	62.16L	Track & Field	1
						62.10B	Swimming	1

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
62.250	Anat.-Physiology I	4	62.253	Kinesiology I	4
62.220	Motor Dev.	4	50.131	Hum. Devel. II	4
62.256	Bas. Athletic Trng.	3	19.105	Found. Psych.	4
12.106	Chem. I	4	12.107	Chem. II	4
62.12P	Rhythmics	1	62.14C	Tennis	1
	Skill Elective	1		Skill Elective	1

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
62.263	Kinesiology II	4	62.251	Anat.-Physiology II	4
50.142	Ed. Stat.	4	62.222	Motor Learn.	4
65.117	Pub. Hlth.	4	62.260	Meas. & Eval.	4
62.248	Clin. Athletic Trng.	2	62.16C	Phys. Condition.	1
62.14A	Badminton	1		Skill Elective	1
				Elective	4

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
62.254	Exer. Physiology	4	62.259	Exer. Testing/ Presc.	3
63.260	Admin. Rec. and Parks	4	62.865	Electrocardiography	2
63.262	Budg. Syst.	4	65.116	Nutrition	4
62.257	Adv. Athletic Trng.	4		Elective	4
62.16B	Weight Trng.	1		Skill Electives	2
	Skill Elective	1			

Fifth Year

Quarter 10			Quarter 11		
No.	Course	Q.H.	No.	Course	Q.H.
62.281	Super. Field Experience	12	62.293	Spec. Prog.	4
			65.225	Com. and Degen. Diseases	4
			62.235	Health Couns.	4
				Elective	4

Specimen Program in Physical Education/Athletic Training Emphasis**First Year**

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
18.141	Bio. I	4	18.142	Bio. II or		10.104	Math.	4
30.113	Fresh Eng. I	4	12.106	Chem. or		62.206	First Aid	2
50.114	Soc. Sci.	4	11.171	Physics	4	65.131	Current Is. Hlth.	4
62.200	Hum. Movt.	3	30.114	Fresh. Eng. II	4	62.209	Hist./Phil. PE	3
62.13V	Gymnastics I	1	62.202	Life/Career Plan.	3	62.205	Grp. Dynamics	3
62.17J	Volleyball	1	50.121	Hum. Dev. I	4	62.16L	Track & Field	1
			62.13W/Y	Gymnastics II	1	62.10B	Swimming	1
			62.17C	Basketball	1			

Second Year (Co-op starts)

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
62.250	Anat.-Physiology I	4	62.253	Kinesiology I	4
62.220	Motor Dev.	4	50.131	Hum. Dev. II	4
62.256	Bas. Athletic Trng.	3	62.221	Motor Dev.	4
62.12P	Rhythmics	1	62.14C	Tennis	1
62.216	Elem. School Act. or			Skill Elective	1
62.219	Sec. School Act.	3		Elective	4
	Elective (Chem./ Physics/Bio. II)	4			

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
62.263	Kinesiology II	4	62.251	Anat.-Physiology II	4
50.142	Ed. Stat.	4	62.222	Motor Learn.	4
62.275	Critical Teaching	3	62.260	Mess. & Eval.	4
62.246	Clin. Athletic Trng.	2	62.217	Theory of Play or	
62.14A	Badminton	1	62.212	Theory of Coaching	2
	Elective	4		TAC	2
			62.16C	Phys. Condition	1
				Skill Elective	1

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
62.254	Exer. Physiology	4	62.280	Curriculum Devel.	3
62.255	Adapted PE I	4	65.118	Nutrition	4
62.257	Adv. Athletic Trng.	4		Elective	4
	Elective	4		TAC	2
	TAC	2		Elective	4

Fifth Year

Quarter 10			Quarter 11		
No.	Course	Q.H.	No.	Course	Q.H.
62.282	Super. Student Teaching		62.270	Admin. of PE	4
	Athletic Trng./ Experience	12		Elective	4
				Elective	4
				Elective	4

180 Q.H. = Minimum graduation requirement for Physical Education

185 Q.H. = Minimum graduation requirement for Athletic Training

20 Q.H. = General Studies electives

10 Q.H. = Boston-Bouvé College of Human Development Professions electives

Specimen Program in Physical Therapy

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course.	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
19.105	Fnd. of Psych. I	4	10.105	Fund. Math.	4	12.107	Gen. Chem.	5
10.104	Fund. Math.	4	12.106	Gen. Chem.	5	18.142	Bas. Ani. Bio.	4
18.141	Bas. Ani. Bio.	4	30.113	Fresh. Eng. I	4	30.114	Fresh. Eng. II	4
65.131	Curr. Iss. in Hlth.	4						

Quarter 1 or Quarter 2

No.	Course	Q.H.
62.206	First Aid	2
64.114	Intro. to Phys. Thrp. I	2

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
11.171	Bas. Physics	4	11.172	Bas. Physics II	4
11.173	Physics Lab I	1	18.144	Hum. Physiology II	4
18.143	Hum. Physiology I	4	18.148	Hum. Anat.	4
62.220	Percep. Motor Devel.	3	19.106	Fnd. Psych. II	4
64.114	Intro. Phys. Thrp. I	2	64.115	Intro. to Phys. Thrp. II	2
	Elective	4			

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
64.123	Clin. Gross Anat.	6	64.130	Clin. Kinesiology	4
64.127	Physiol. for Phys. Thrpsts.	3	64.142	Phys. Thrp. II	3
64.141	Phys. Thrp. I	2	64.143	Phys. Thrp. III	4
64.257	Clin. Medicine I	4	64.229	Clin. Medicine II	3
			64.234	Clin. Psychiatry	2

Fourth Year**Quarter 8**

No.	Course	Q.H.
64.156	Phys. Thrp. IV	3
64.256	Phys. Thrp. V	4
64.251	Neuroanat.	4
64.149	Clin. Seminar	2

Quarter 9

No.	Course	Q.H.
64.169	Phys. Thrp. VII	2
64.184	Super. Clin. Educ.	5
64.255	Clinic. Medicine III	3
64.171	Phys. Thrp. VI	2
64.148	Phys. Thrp. V cont.	1

Fifth Year**Quarter 10**

No.	Course	Q.H.
64.176	Admin.	3
64.167	Research for Phys. Thrp.	4
64.178	Phys. Thrp. VIII	2
64.194	Super. Clin. Ed. II Elective Elective	

Quarter 11

No.	Course	Q.H.
64.173	Phys. Thrp. In Hlth. Care Syst.	3
64.182	Psychosoc. Asp. of Illness	3
64.239	Invest. Studies Elective	6 4

Department of Recreation and Leisure Studies**Areas of Concentration Required Courses****Quarter Offered****1. Therapeutic Recreation**

63.249	Process of Aging	6-8-10
63.162	Overview of Physical Disabilities	6-8-10
63.153	Social and Psychological Impacts of Disabilities	8-10
63.169	Program Planning in Therapeutic Recreation	8-10
63.156	Foundations of Psychological Services in Therapeutic Recreation	10-11
Plus thirteen quarter hours of guided department electives		

2. Recreation Management

63.168	Budget Analysis	6-8-10
63.174	Elements of Outdoor Recreation Planning	6-8-10
63.260	Administration of Recreation and Parks	6-8-10
63.264	Program Evaluation	7-11
Plus sixteen quarter hours of guided department electives		

3. Outdoor Recreation/Environment Education

63.128	Survey of Facilities	7-11
63.170	Interpretations of Economic Social History	6-8-10
63.171	Environmental Education	7-8-11
63.172	Seminar on Environmental Issues and Legislation	6-8-10
63.174	Elements of Outdoor Recreation Planning	6-8-10
Plus thirteen quarter hours of guided department electives		

Specimen Programs in Teacher Preparation

General Requirements:

Students must complete the following requirements to earn a Bachelor of Science degree in Education:

1. Distribution requirements with a minimum of sixteen quarter hours in each one of these areas: humanities, mathematics/sciences, and social sciences.
2. Major course requirements as listed on pages 27-31. (In addition to those courses required of all Elementary Education majors, students in this major must take designated courses in one area of emphasis chosen from the following: humanities, early childhood education, social sciences, mathematics/sciences, language/reading, and special education.)
3. Designated electives offered by the College of Arts and Sciences and the Boston-Bouvé College of Human Development Professions. These electives, which depend on the particular program of study, are in the areas of English, history, drama/speech, political science, economics, earth science, and the foundations of education.

There is no language requirement.

As early as possible students should discuss their curriculum questions and academic needs with a representative of the Dean's Office or a faculty adviser.

Specimen Program in Early Childhood Education (K-3)

Freshman Year (48 Q.H.)

- 23.101 Western Civ. I
- 30.113 Freshman English I
- 50.114 Education and Social Science
- 51.158 Education for the Future
- 16.____ Earth Science (Elective)
- 23.102 Western Civ. II
- 39.115 Economics
- 16.____ Earth Science (Elective)
- 22.____ Political Science (Elective)
- 50.162 Day Care and Nursery Schools
- 30.114 Freshman English II
- 30.____ English (Elective)

Middler Year (35 Q.H.)

- 51.123 Fundamentals of Reading I
- 51.154 Math/Science I
- 51.152 Literature and Learning Materials
- 51.155 Math/Science II
- 51.134 Fundamentals of Reading II (6 Q.H.)
- 50.____ Educational Humanities Elective
- 22.____ Political Science Elective
- 23.____ History Elective

Senior Year (32 Q.H.)

- 51.138 Linguistics and Reading
- 55.131 Semantics and Syntax
- 51.151 Student Teaching (8 Q.H.)
- 23.____ History Elective
- Math/Science Elective
- Elective
- Elective

Sophomore Year (30 Q.H.)

- 51.135 Analysis of the Instructional Process
- 50.121 Human Development I
- 56.120 Introduction to Special Education
- 62.191 Motor Skills Development (2 Q.H.)
- 55.122 Introduction to Speech and Hearing
- 50.132 Creative Expression in Children
- 30.____ English Elective
- Humanities Elective

Junior Year (36 Q.H.)

- 51.156 Elementary Education Curriculum I
- 51.137 Remedial Reading
- 51.157 Elementary Education Curriculum II
- 50.141 Measurement and Evaluation
- 90.253 Professional Development (1 Q.H.)
- 50.136 Language and Cognition
- 50.139 Seminar in Early Childhood
- 51.150 Field Placement (2 Q.H.)
- 29.____ Drama or
- 37.____ Speech
- Math/Science Elective

182 Q.H. = Minimum graduation requirement

Specimen Program in Elementary Education (Humanities Emphasis)

Freshman Year (48 Q.H.)

- 23.101 Western Civ. I
- 30.113 Freshman English I
- 50.114 Education and Social Science
- 51.158 Education for the Future
- 16.____ Earth Science (Elective)
- 23.102 Western Civ. II
- 39.115 Economics
- 16.____ Earth Science (Elective)
- 22.____ Political Science (Elective)
- 30.114 Freshman English II
- 30.____ English (Elective)
- 50.____ Educational Sociology Elective

Middler Year (34 Q.H.)

- 51.123 Fundamentals of Reading I
- 51.154 Math/Science I
- 51.152 Literature and Learning Materials
- 51.155 Math/Science II
- 51.134 Fundamentals of Reading II (6 Q.H.)
- 50.____ Educational Humanities Elective
- 22.____ Political Science Elective
Humanities Elective

Senior Year (32 Q.H.)

- 51.151 Student Teaching (8 Q.H.)
Math/Science Elective
Humanities Elective
Humanities Elective
Humanities Elective
Elective
Elective

182 Q.H. = Minimum graduation requirement

Sophomore Year (32 Q.H.)

- 51.135 Analysis of the Instructional Process
- 50.121 Human Development I
- 56.120 Introduction to Special Education
- 50.131 Human Development I
- 30.____ English (Elective)
Humanities (Elective)
- 23.____ History Elective
Elective

Junior Year (33 Q.H.)

- 51.156 Elementary Education Curriculum I
- 51.157 Elementary Education Curriculum II
- 50.141 Measurement and Evaluation
- 90.253 Professional Development (1 Q.H.)
- 23.____ History Elective
- 29.____ Drama or
- 37.____ Speech
Math/Science Elective
Humanities Elective
Humanities Elective

Specimen Program in Elementary Education (Language/Reading Emphasis)

Freshman Year (48 Q.H.)

- 23.101 Western Civ. I
- 30.113 Freshman English I
- 50.114 Education and Social Science
- 51.158 Education for the Future
- 16.____ Earth Science Elective
- 23.102 Western Civ. II
- 39.115 Economics
- 16.____ Earth Science Elective
- 22.____ Political Science Elective
- 30.114 Freshman English II
- 30.____ English Elective
- 50.____ Educational Sociology Elective

Middler Year (35 Q.H.)

- 51.123 Fundamentals of Reading I
- 51.154 Math/Science I
- 51.152 Literature and Learning Materials
- 51.155 Math/Science II
- 51.134 Fundamentals of Reading II (6 Q.H.)
- 50.____ Educational Humanities Elective
- 22.____ Political Science Elective
Elective

Sophomore Year (33 Q.H.)

- 51.135 Analysis of the Instructional Process
- 50.121 Human Development I
- 56.120 Introduction to Special Education
- 50.131 Human Development II
- 30.____ English Elective
Humanities Elective
- 23.____ History Elective
Elective

Junior Year (34 Q.H.)

- 51.156 Elementary Education Curriculum I
- 51.157 Elementary Education Curriculum II
- 50.141 Measurement and Evaluation
- 90.253 Professional Development (1 Q.H.)
- 23.____ History Elective
- 29.____ Drama or
- 37.____ Speech
- 51.137 Remedial Reading
- 51.138 Linguistics and Reading
Math/Science Elective

Senior Year (32 Q.H.)

- 51.151 Student Teaching (8 Q.H.)
 - Language/Reading
 - Language/Reading
 - Math/Science Elective
 - Elective
 - Elective
 - Elective

182 Q.H. = Minimum graduation requirement

Specimen Program in Elementary Education (Social Sciences Emphasis)

Freshman Year (48 Q.H.)

- 23.101 Western Civ. I
- 30.113 Freshman English I
- 50.114 Education and Social Science
- 51.158 Education for the Future
- 16.____ Earth Science Elective
- 23.102 Western Civ. II
- 39.115 Economics
- 16.____ Earth Science Elective
- 22.____ Political Science Elective
- 30.114 Freshman English II
- 30.____ English Elective
- 50.____ Educational Sociology Elective

Middler Year (35 Q.H.)

- 51.123 Fundamentals of Reading I
- 51.154 Math/Science I
- 51.152 Literature and Learning Materials
- 51.155 Math/Science II
- 51.134 Fundamentals of Reading II (6 Q.H.)
- 50.____ Educational Humanities Elective
- 22.____ Political Science Elective
- Social Science Elective

Senior Year (32 Q.H.)

- 51.151 Student Teaching (8 Q.H.)
 - Math/Science Elective
 - Social Science Elective
 - Elective
 - Elective
 - Elective

182 Q.H. = Minimum graduation requirement

Sophomore Year (33 Q.H.)

- 51.135 Analysis of the Instructional Process
- 50.121 Human Development I
- 56.120 Introduction to Special Education
- 50.131 Human Development II
- 30.____ English Elective
- Humanities Elective
- 23.____ History Elective
- Elective

Junior Year (34 Q.H.)

- 51.156 Elementary Education Curriculum I
- 51.157 Elementary Education Curriculum II
- 50.141 Measurement and Evaluation
- 90.253 Professional Development (1 Q.H.)
- 23.____ History Elective
- 29.____ Drama or
- 37.____ Speech
- Math/Science Elective
- Social Science Elective
- Social Science Elective

Specimen Program in Elementary Education (Special Education Emphasis)

Freshman Year (48 Q.H.)

- 23.101 Western Civ. I
- 30.113 Freshman English I
- 50.114 Education and Social Science
- 51.158 Education for the Future
- 16.____ Earth Science Elective
- 23.102 Western Civ. II
- 39.115 Economics
- 16.____ Earth Science Elective
- 22.____ Political Science Elective
- 30.114 Freshman English II
- 30.____ English Elective
- 50.____ Educational Sociology Elective

Middler Year (35 Q.H.)

- 51.123 Fundamentals of Reading I
- 51.154 Math/Science I
- 51.152 Literature and Learning Material
- 51.155 Math/Science II
- 51.134 Fundamentals of Reading II (6 Q.H.)
- 50.____ Educational Humanities Elective
- 22.____ Political Science Elective
- 19.202 Psychology of Abnormal Behavior

Senior Year (32 Q.H.)

- 51.151 Student Teaching (8 Q.H.)
- 56.150 Introduction to Rehabilitation
- 56.124 Diagnostics in Special Education
- 56.135 Socio-Psycho Dynamics of Family Life
- 56.126 Methods and Materials of Special Education
 - Math/Science Elective
 - Math/Science Elective

182 Q.H. = Minimum graduation requirement

Sophomore Year (33 Q.H.)

- 51.135 Analysis of the Instructional Process
- 50.121 Human Development I
- 56.120 Introduction to Special Education
- 50.131 Human Development II
- 30.____ English Elective
- 55.122 Introduction to Speech and Hearing Humanities Elective
- 23.____ History Elective

Junior Year (34 Q.H.)

- 51.156 Elementary Education Curriculum I
- 51.157 Elementary Education Curriculum II
- 50.141 Measurement and Evaluation
- 90.253 Professional Development (1 Q.H.)
- 23.____ History Elective
- 29.____ Drama or
- 37.____ Speech
- 56.121 Introduction to Learning Disabilities
- 56.140 Psychology of the Mentally Retarded
- 56.130 Introduction to the Emotionally Disturbed

Specimen Program in Speech and Hearing

First Year

Quarter 1

- | | | | |
|--------|------------------------|------|---|
| 30.113 | Fresh. English I | Q.H. | 4 |
| 50.114 | Ed. & Soc. Sci. | 4 | |
| 18.116 | Hum. Orgnsm. Elective* | 4 | |

Quarter 2

- | | | | |
|--------|---------------------------|------|---|
| 30.114 | Fresh. English II | Q.H. | 4 |
| 55.159 | Bas. Man. Comm. Elective* | 4 | |
| | Elective* | 4 | |

Quarter 3

- | | | | |
|--------|---------------|------|---|
| 55.122 | Intro. Speech | Q.H. | 4 |
| | Elective* | 4 | |
| | Elective* | 4 | |
| | Elective* | 4 | |

Second Year

Quarter 4

- | | | | |
|--------|----------------------------|------|---|
| 50.142 | Intro. Ed. Stat. | Q.H. | 4 |
| 55.125 | Hearing Sci. | 4 | |
| 56.120 | Intro. Spec. Ed. Elective* | 4 | |

Quarter 5

- | | | | |
|--------|----------------------------|------|---|
| 50.121 | Hum. Dev. I | Q.H. | 4 |
| 55.126 | Anat. Voc. Mech. Elective* | 4 | |
| | Elective* | 4 | |

Third Year**Quarter 6**

55.133	Dev. Phonology	4
19.135	Personality I	4
55.131	Dev. Semantics	4
	Elective*	4

Quarter 7

19.136	Personality II	4
55.141	Phonemic Dis.	4
55.142	Intro. Audiology	4
	Elective*	4

Fifth Year**Quarter 10**

19.202	Abn. Psych. I	4
55.128	Psychoacoustics Lab.	4
	Elective*	4

Quarter 10a

55.155	Clin. Prac	8
--------	------------	---

Quarter 11

19.203	Psych. II	4
	Elective*	4

Fourth Year**Quarter 8**

55.123	Speech Sci.	4
51.133	Fund. Read. I	4
55.154	Fluency Dis.	4
90.253	Prof. Dev.	4

Quarter 9

55.143	Diagnostic Tech.	4
55.144	Orient. Clin. Prac.	4
55.127	Intro. Psychoacoustics	1
	Elective*	4

*Electives must include: 8 Q.H. in Ed. Soc.; 4 Q.H. in Ed. Psych.; 16 Q.H. in Lib. Arts Humanities; 4 Q.H. in Lib. Arts Soc. Sci.; 4 Q.H. in Ed.; and 8 Q.H. in Lib. Arts Math/Sci.

177 Q.H. = Minimum graduation requirement.

College of Business Administration

Specimen Program for First Three Quarters

The courses taken in the first three quarters are the same for all concentrations.

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
41.111	Acct. Prin. I	4	41.112	Acct. Prin. II	4	49.100	Intro. Bus.	4
10.119	Fund. of Math.	4	49.249	Intro. Quan.	4	30.114	Fresh. Eng. II	4
30.113	Fresh. Eng. I	4		Meth. in Bus.	4	39.106	Prin. of Econ. (Micro)	4
	Nonbus. Elective	4	39.105	Prin. of Econ. (Macro)	4		Nonbus. Elective	4
				Nonbus. Elective	4			

Accounting

Quarter 4 49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.

Quarter 5 49.251, Business Statistics II; three arts and sciences electives.

Quarter 6 41.251, Intermediate Accounting I; 45.209, Organizational Behavior; 43.120, Introduction to Marketing; one arts and sciences elective.

Quarter 7 41.252, Intermediate Accounting II; 41.253, Cost Accounting I; 45.210, Complex Organizations; 44.120, Introduction to Finance.

Quarter 8 41.254, Cost Accounting II; 41.255, Intermediate Accounting III; arts and sciences elective; open elective.

Quarter 9 45.250, Business and Society; 41.262, Accounting Theory and Practice, or 41.263, Accounting Planning and Control; 45.265, Operations Management; open elective.

Quarter 10 45.112, Business Policy; two open electives; non-accounting elective.

Quarter 11 Two open electives; non-accounting elective; arts and sciences elective.

Entrepreneurship and New Venture Management

Quarter 4 49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.

Quarter 5 49.251, Business Statistics II; three arts and sciences electives.

Quarter 6	45.209, Organizational Behavior; 45.212, New Venture Creation; 43.120, Introduction to Marketing; open elective.
Quarter 7	45.210, Complex Organizations; 44.120, Introduction to Finance; two open electives.
Quarter 8	45.130, Operations Analysis and Venture Capital; arts and sciences electives; open elective.
Quarter 9	44.159, Small Business Finance; 45.250, Business and Society; 45.265, Operations Management; open elective.
Quarter 10	45.112, Business Policy; 49.107, Small Business Management; arts and sciences elective; open elective.
Quarter 11	45.295, Small Business Institute Field Project; two open electives.

Finance and Insurance

Quarter 4	49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
Quarter 5	49.251, Business Statistics II; three arts and sciences electives.
Quarter 6	44.120, Introduction to Finance; 44.275, Money and Business Activity; 45.209, Organizational Behavior; arts and sciences elective.
Quarter 7	44.154, Managerial Finance; 43.120, Introduction to Marketing; 45.210, Complex Organizations; arts and sciences elective.
Quarter 8	44.181, Investment Management; finance elective; business elective; open elective.
Quarter 9	45.250, Business and Society; finance elective; 45.265, Operations Management; open elective.
Quarter 10	45.112, Business Policy; finance elective; two open electives.
Quarter 11	All open electives.

General Business Administration

Quarter 4	49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
Quarter 5	49.251, Business Statistics II; three arts and sciences electives.
Quarter 6	45.209, Organizational Behavior; 44.120, Introduction to Finance; business elective; open elective.
Quarter 7	45.210, Complex Organizations; 43.120, Introduction to Marketing; business elective; open elective.
Quarter 8	Arts and sciences elective; two business electives; open elective.
Quarter 9	45.250, Business and Society; arts and sciences elective; 45.265, Operations Management; open elective.
Quarter 10	45.112, Business Policy; arts and sciences elective; business elective; open elective.
Quarter 11	Business elective; three open electives.

Human Resources Management

Quarter 4	49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
Quarter 5	49.251, Business Statistics II; three arts and sciences electives.
Quarter 6	45.209, Organizational Behavior; 43.120, Introduction to Marketing; two open electives.
Quarter 7	45.210, Complex Organizations; 45.272, People and Productivity; 44.120, Introduction to Finance; open elective.
Quarter 8	45.273, Personnel Administration; 45.277, Reward Systems; arts and sciences elective; open elective.

- Quarter 9** 45.250, Business and Society; open elective; 45.265, Operations Management; Human Resources Management elective.
- Quarter 10** 45.274, Contemporary Labor Issues; Human Resources Management elective; 45.112, Business Policy; arts and sciences elective.
- Quarter 11** Arts and sciences elective; three open electives.

International Business Administration

- Quarter 4** 49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
- Quarter 5** 49.251, Business Statistics II; three arts and sciences electives.
- Quarter 6** 45.209, Organizational Behavior; 46.100, Introduction to International Business; 44.120, Introduction to Finance; open elective.
- Quarter 7** 45.210, Complex Organizations; 43.120, Introduction to Marketing; business elective; open elective.
- Quarter 8** Liberal International elective; business elective; arts and sciences elective; open elective.
- Quarter 9** 45.250, Business and Society; 45.265, Operations Management; Business International elective; open elective.
- Quarter 10** 45.112, Business Policy; Arts and Sciences International elective; two open electives.
- Quarter 11** 46.101, Seminar in International Business; Business International elective; two open electives.

Note: A list of Arts and Sciences electives that count toward the International Business concentration and the scheduled offerings of the International Business electives are available for program planning. Students should consult this list and the schedule of offerings. Students should consider a dual concentration.

Management

- Quarter 4** 49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
- Quarter 5** 49.251, Business Statistics II; three arts and sciences electives.
- Quarter 6** 45.209, Organizational Behavior; 44.120, Introduction to Finance; open elective; business elective.
- Quarter 7** 45.210, Complex Organizations; 45.272, People and Productivity; Human Resources Management elective; 41.205, Cost Accounting for Management; 43.120, Introduction to Marketing.
- Quarter 8** 49.155, Legal Aspects of Business; business elective; arts and sciences elective; open elective.
- Quarter 9** 45.250, Business and Society; 45.265, Operations Management; arts and sciences elective; open elective.
- Quarter 10** 45.112, Business Policy; arts and sciences elective; two open electives.
- Quarter 11** Three open electives; business elective.

Marketing

- Quarter 4** 49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
- Quarter 5** 49.251, Business Statistics II; three arts and sciences electives.
- Quarter 6** 43.120, Introduction to Marketing; 45.209, Organizational Behavior; arts and sciences elective; open elective.
- Quarter 7** 43.252, Marketing Management; 45.210, Complex Organizations; 44.120, Introduction to Finance; open elective.

Quarter 8	43.240, Marketing Research; marketing elective; arts and sciences elective.
Quarter 9	45.250, Business and Society; marketing elective; 45.265, Operations Management; open elective.
Quarter 10	43.278, Competitive Strategy; 45.112, Business Policy; arts and sciences elective; open elective.
Quarter 11	Marketing elective; three open electives.

Transportation and Physical Distribution Management

Quarter 4	49.250, Business Statistics I; 49.205, Introduction to Data Processing; two arts and sciences electives.
Quarter 5	49.251, Business Statistics II; three arts and sciences electives.
Quarter 6	48.101, Principles of Transportation; 45.209, Organizational Behavior; 44.120, Introduction to Finance; open elective.
Quarter 7	45.210, Complex Organizations; 43.120, Introduction to Marketing; 48.104, Physical Distribution Management; open elective.
Quarter 8	Transportation elective; two arts and sciences electives; open elective.
Quarter 9	45.250, Business and Society; 48.102, Current Issues in Transportation Policy; 45.265, Operations Management; open elective.

Quarter 10	45.112, Business Policy, transportation elective; arts and sciences elective; open elective.
Quarter 11	48.120, Seminar in Transportation; three open electives.

College of Computer Science

Specimen Program in Computer Science

First Year

Quarter 1

No.	Course	Q.H.
06.100	PASCAL I	4
10.150	Calculus I	4
30.113	Fresh. Engl. I	4
23.101	Western Civ.	4

Quarter 2

No.	Course	Q.H.
06.101	PASCAL II	4
10.151	Calculus II	4
10.210	Discr. Math I	4
30.114	Fresh. Engl. II	4
06.110	FORTTRAN Lab	1

Quarter 3

No.	Course	Q.H.
06.102	LISP	4
10.152	Calculus III	4
11.101	Physics I	4
06.113	COBOL Lab	1
	Elective/Subarea (1)	4

Second Year

Quarter 4

No.	Course	Q.H.
11.102	Physics II	4
06.130	Assembly Lang. I	4
06.201	Data Structures	4
10.153	Calculus IV	4
06.111	DCL Lab	1

Quarter 5

No.	Course	Q.H.
11.103	Physics III	4
06.131	Assembly Lang. II	4
10.211	Discrete Math II	4
06.205	Software Design	4

Third Year

Quarter 6

No.	Course	Q.H.
03.191	Comp. Org. & Des. I	4
10.246	Linear Algebra	4
06.____	C.S. Elective (1)	4
	Elective/Subarea (2)	4

Quarter 7

No.	Course	Q.H.
03.192	Comp. Org. & Des. II	4
10.208	Probability	4
06.____	C.S. Elective (2)	4
30.200	Tech. Writing	4

Fourth Year

Quarter 8

No.	Course	Q.H.
06	C.S. Elective (3)	4
06	C.S. Elective (4)	4
	Elective/Subarea (3)	4
	Elective/Subarea (4)	4

Quarter 9

No.	Course	Q.H.
06	C.S. Elective (5)	4
06	C.S. Elective (6)	4
21.173	Computers & Soc.	4
	Elective/Subarea (5)	4

Fifth Year

Quarter 10

No.	Course	Q.H.
06	C.S. Elective (7)	4
	Elective/Subarea (6)	4
	Elective/Subarea (7)	4
	Elective/Subarea (8)	4

Quarter 11

No.	Course	Q.H.
06	C.S. Elective (8)	4
06.295	C.S. Seminar	1
	Elective/Subarea (9)	4
	Elective/Subarea (10)	4
	Elective/Subarea (11)	4

Note: Three of the Computer Science electives must form a complete track.

Computer Science Major Requirements Checklist

Computer Science

Level I

No.	Course	Q.H.
06.100	PASCAL I	4
06.101	PASCAL II	4
06.102	LISP	4
06.110	FORTTRAN Lab	1
06.113	COBOL Lab	1
06.111	DCL Lab	1
06.201	Data Structures	4
06.205	Software Design	4
06.130	Assembly Language I	4
06.131	Assembly Language II	4

Level II (select eight courses, including at least one complete track)

No.	Course	Q.H.
Data Base Track		
06.220	File Structures	4
06.225	Data Base Management I	4
06.226	Data Base Management II	4
Systems Track		
06.228	Systems Programming	4
06.230	Operating Systems I	4
06.231	Operating Systems II	4

Languages Track

06.250	Automata & Formal Lang	4
06.260	Compiler Design I	4
06.261	Compiler Design II	4

Electives

06.240	Analysis of Prog. Lang.	4
06.265	Analysis of Algorithms	4
06.280	Artificial Intelligence	4
06.210	Computer Graphics	4

Seminar (To be taken during senior year.)

06.296	Computer Science Seminar	1
--------	--------------------------	---

Mathematics

Level I

No.	Course	Q.H.
10.150	Calculus I	4
10.151	Calculus II	4
10.152	Calculus III	4
10.153	Calculus IV	4
10.210	Discrete Structures I	4
10.211	Discrete Structures II	4

Level II

No.	Course	Q.H.
10.208	Probability	4
10.246	Linear Algebra	4

Physics**Level II**

No.	Course	Q.H.
11.101	Physics I	4
11.102	Physics II	4
11.103	Physics III	4

Electrical Engineering**Level II**

No.	Course	Q.H.
03.191	Computer Org. and Des. I	4
03.192	Computer Org. and Des. II	4

Other Subject Areas**Level II**

No.	Course	Q.H.
30.113	Freshman English I	4
30.114	Freshman English II	4
30.200	Technical Writing	4
23.101	Western Civilization	4
21.173	Computers and Society	4

Electives (total 24 Q.H.)**Subarea (total 20 Q.H.)****Computer Science Requirements****Requirements for Computer Science Majors:****Computer Science Courses**

Computer Science courses fall into one of two levels. Level I consists of Courses: 06.100, 06.101, 06.102, 06.130, 06.131, 06.201, 06.205; Labs: 06.110, 06.111, 06.113.

All Level I courses and labs are required for the major. The rest of the computer science courses are in Level II. Majors must take eight Level II courses; three of these must form one of the following tracks: Data Base Track 06.220, 06.225, 06.226; Systems Track 06.228, 06.230, 06.231; Languages Track 06.250, 06.260, 06.261.

Finally, majors must take the one-credit seminar 06.295 during their senior year.

Mathematics Courses

Majors must take the following eight mathematics courses: Level I Calculus 10.150, 10.151, 10.152, and 10.153; Discrete Mathematics 10.210, 10.211.

Level II Probability 10.208; Linear Algebra 10.246.

Physics Courses

Majors must take the following three physics courses: Physics 11.101, 11.102, and 11.103.

Electrical Engineering Courses

Majors must take the following two electrical engineering courses: Digital Computers 03.191 and 03.192.

Other Subject Areas

Majors must take the following five courses: English 30.113 and 30.114; Technical Writing 30.200; Computers and Society 21.173; Western Civilization 23.101.

In addition, majors must take at least five courses in a selected subarea of humanities, science, social science, business, education, or engineering. The College of Computer Science will provide lists of suitable courses in a variety of subareas.

Majors have six free electives. However, at least three courses among the total eleven (five in the subarea and six electives) must be in social sciences or humanities.

NOTES 1. The total number of credit hours required for graduation is 180.

2. During the first two years, students should take all Level I computer science and mathematics courses, physics, English, Western Civilization, and one other course. The three computer science track courses should be taken in the third and fourth year. See the Specimen Program for details on program arrangement.

Requirements for Computer Science Minors:

In addition to fulfilling the requirements of their major department, students who wish to minor in computer science must take the seven Level I full courses: 06.100, 06.101, 06.102, 06.130, 06.131, 06.201, and 06.205.

College of Criminal Justice

Specimen Program in Criminal Justice

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
92.104	Admin. Crim. Just.	4	39.116	Prin./Prob. Econ.	4	21.100	Intro. Soc.	4
39.115	Prin./Prob. Econ.	4	22.111	Intro. Amer. Gov.	4	19.106	Fnd. Psych. II	4
22.110	Intro. Politics	4	30.113	Fresh. Eng. I	4	30.114	Fresh. Eng. II	4
19.105	Fnd. Psych. I	4	92.181	Crit. Issues in Crim. Jus.	4	92.182	Crit. Issues in Crim. Jus. Admin.	4

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
22.141	State & Loc. Gov.	4		Math/Sci. Require.	4
92.141	Crim. Law	4		Non-Crim. Jus. Elective	4
92.137	Criminology	4	92.____	Crim. Jus. Elective	4
	Math/Sci. Require.	4	92.134	Constitutional Prob.	4

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
92.____	Crim. Jus. Elective	4	92.____	Crim. Jus. Elective	4
	Non-Crim. Justice Elective	4		Non-Crim. Jus. Elective	4
92.114	Crim. Jus. Research	4		Non-Crim. Jus. Elective	4
23.101	Western Civ. I	4	23.102	Western Civ. II	4

Fourth Year

Fifth Year

Quarters 8-11

No.	Course	Q.H.	No.	Course	Q.H.
92.____	Crim. Jus. Electives	24		Non-Crim. Jus. Electives	36

College of Engineering

Specimen Program in Chemical Engineering

All courses in Chemical Engineering must be taken in sequence shown.

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
10.150	Calculus I	4	10.151	Calculus II	4	10.152	Calculus III	4
11.203	Physics I	4	11.204	Physics II	4	11.205	Physics III	4
09.108	Comp. for Eng.	4	09.109	Engr. Graph. and Des.	4	12.115	Gen. Chem.	4
30.114	Intro. Lit.	4	12.114	Gen. Chem.	4	30.115	Gr. Th. Lit.	4

First-year pattern of two-term courses may vary according to assigned section.

Quarters 4, 6, 8, and 10 offered Fall and Winter.

Quarters 5, 7, and 9 offered Spring and Summer.

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
10.153	Calculus IV	4	10.154	Calculus V	4
11.206	Physics IV	4	04.102	Chem. Engr. Cal. II	4
04.101	Chem. Engr. Cal. I	4	04.108	Poly. Sci. and Engr.	4
12.147	Organic Chem. I	4	12.148	Organic Chem. II	4
11.110	Physics Lab I	1	11.111	Physics Lab II	1

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
10.155	Math. Analysis I	4	10.156	Math. Analysis II	4
04.111	Chem. Engr. I	4	04.112	Chem. Engr. II	4
12.161	Phys. Chem. I	4	12.162	Phys. Chem. II	4
39.115	Economics I	4	39.116	Economics II	4

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
04.121	Trans. Phen. I	4	04.122	Trans. Phen. II	4
04.123	Exp. Methods I	4	04.124	Exp. Methods II	4
04.126	Chem. Engr. Therm.	4	04.136	Chem. Engr. Kinet.	4
	Soc. Sci./ Hum. Elective	4		Soc. Sci./ Hum. Elective	4

Fifth Year

Quarter 10*			Quarter 11*		
No.	Course	Q.H.	No.	Course	Q.H.
04.131	Proc. Des. I	6	04.132	Proc. Des. II	6
04.133	Projects I	6	04.134	Projects II	6
04.____	Chem. Engr. Elective	4	04.____	Chem. Engr. Elective	4
04.____	Chem. Engr. Elective	4	04.____	Chem. Engr. Elective	4
	Soc. Sci./ Hum. Elective	4		Soc. Sci./ Hum. Elective	4

* Quarters 10 and 11 must be approved by department adviser.

Specimen Program in Civil Engineering

First Year

Quarter 1				Quarter 2				Quarter 3			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
09.108	Comp. for Engr.	3	4	09.109	Engr. Graph. and Des.	3	4	10.152	Calculus III	3	4
10.150	Calculus I	3	4					11.205	Physics III	3	4
11.203	Physics I	3	4	10.151	Calculus II	3	4	12.115	Gen. Chem.	3	4
30.114	Fresh. Engl. II	3	4	11.204	Physics II	3	4	30.115	Gr. Th. Lit.	3	4
				12.114	Gen. Chem.	3	4				

Second Year

Quarter 4				Quarter 5			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
11.110	Physics Lab I	0(3)	1	11.111	Physics Lab II	0(3)	1
10.153	Calculus IV	3	4	10.154	Calculus V	3	4
01.116	Engr. Meas.	3	4	39.116	Economics II	3	4
01.117	Engr. Meas. Lab.	0(3)	2	01.141	Struct. Mech. 2	3	4
01.140	Struct. Mech. I	3	4	01.116	Engr. Meas.	3	4
01.110	Comp. Appl. in CE	3	4	01.117	Engr. Meas. Lab	0(3)	2
01.180	Materials	3	4	01.180	Materials	3	4
01.181	Materials Lab	0(3)	2	01.181	Materials Lab	0(3)	2

01.116, 01.117 offered Fall and Summer quarters.

01.180, 01.181 offered Winter and Spring quarters.

Third Year

Quarter 6				Quarter 7			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
10.155	Math. Anal. I	3	4	10.156	Math. Analysis II	3	4
02.116	Dynamics	3	4	01.180	Materials	3	4
01.141	Struct. Mech. II	3	4	01.120	Fluid Mech. I	3	4
	Soc. Sci./			37.109	Effect. Speaking	2	2
	Hum. Elec.	3	4	01.143	Struct. Analysis I	3	4

Fourth Year

Quarter 8				Quarter 9			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
03.183	Elec. Engr. I	3	4	01.193	Environ. Engr. I	3	4
01.178	Soil Mech.*	3	4	01.150	Concrete Des. I*	3	4
01.179	Soil Mech. Lab*	0(3)	2		or		
	or			01.178	Soil Mech.	3	4
01.150	Concrete Des. I*	3	4	01.179	Soil Mech. Lab	(3)	2
	Tech. Elective	3	4		Tech. Elective		4
	Soc. Sci./				Soc. Sci. Hum.		
	Hum. Elec.				Elective		4

Fifth Year

Quarter 10				Quarter 11			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
01.160	Struct. Des.	3	4		Gen. Elective†	3	4
	Soc. Sci./				Tech. Elective	3	4
	Hum. Elec.	3	4		Tech. Elective	3	4
	Tech. Elective	3	4		Tech. Elective	3	4
	Tech. Elective	3	4				

* In Quarter 8 one-half of the class takes 01.150, the other 01.178 and 01.179; in Quarter 9 the sections are reversed.

† This may be a technical or arts and sciences elective or any other course given at the University. The general elective may be interchanged with an arts and sciences elective in another quarter, with the approval of the Civil Engineering Department.

Technical Electives

Fall-Winter
Quarters 8 & 10Spring
Quarters 9 & 11

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
01.101	Special Topics		4	01.101	Special Topics		4
01.102	Special Topics		4	01.102	Special Topics		4
01.122	Hydraulic Engr.*	3	4	01.105	C.E. Engr. Sys.	3	4
01.142	Struct. Mech. III†	3	4	01.135	Constr. Engr.	3	4
01.152	Concrete Des. II†	3	4	01.136	Highway Engr.	3	4
01.175	Geotechnology	3	4	01.161	Struct. Des. II†	3	4
01.194	Environ. Engr. II*	3	4	01.174	Found. Engr.†	3	4
01.106	App. Probability†	3	4	01.196	Environ. Des.*	3	4
01.144	Struct. Analysis†	3	4	01.107	Tech. Assess.	3	4
05.245	Bas. Engr.			01.210	Legal Aspects	3	4
	Statistics	3	4	01.134	Transp. Engr.	3	4
05.260	Engr. Economy†	3	4	01.145	Struct. Analysis		
01.195	Envl. &				III†	3	4
	Hydraulics Lab*	3	4	01.259	Air Pollution*	3	4
				05.245	Engr. Statistics	3	4
				05.260	Engr. Economy	3	4

*Required for Environmental Concentration

†Recommended for Structures Concentration

Note: During the summer the Civil Engineering Department offers a limited number of technical electives. Students should check with the Department for specific information. Technical electives from other engineering departments may be elected with the approval of the Civil Engineering Department Curriculum Committee.

Specimen Program in Civil Engineering

Approved for progressive implementation beginning with second year for class of 1987.

First Year

Same as current program

Second Year

Quarter 4

Quarter 5

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
10.153	Calc. IV	3	4	10.154	Calc. V	3	4
01.140	Struc. Mech. I	3	4	39.116	Econ.	3	4
01.110	Comb. App. CE	3	4	01.141	Struc. Mech. II	3	4
01.116	Engr. Meas.	3	4	01.180	Materials	3	4
01.117	Engr. Meas. Lab	0(3)	2	01.181	Mat. Lab	0(3)	2
11.110	Phys. Lab I	0(3)	1	11.111	Phys. Lab II	0(3)	1

01.180, 01.181 offered Winter and Spring Quarters.

01.116, 01.117 offered Fall and Summer Quarters.

Third Year

Quarter 6

Quarter 7

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
10.155	Math. Anal.	3	4	37.115	Intro. Commun.		
01.147	Syst. Dynam.	3	4		Skills	3	4
01.120	Fluid Mech.	3	4	01.105	C.E. Systems	3	4
	Lib. Arts			01.193	Env. Engr. I	3	4
	Elective	3	4	01.143	Des. & Struc.		
					Anal.	3	4
				01.146	Des. & Struc.		
					Anal. Lab	0(3)	2

Fourth Year

Quarter 8

Quarter 9

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
01.178	Soil Mech.	3	4	05.260	Engr. Econ.	3	4
01.179	Soils Lab	0(3)	2		Engr. Sci. Elective		
11.206	Physics IV	3	4		or Elec. Engr. I	3	4
	Tech. Elective	3	4	03.183	Tech. Elective	3	4
	Tech. Elective	3	4		Tech. Elective	3	4

Fifth Year

Quarter 10

Quarter 11

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
01.106	App. Prob. for C.E. or	3	4		Gen. Elective	3	4
03.183	Engr. Sci. Elec.	3	4		Lib. Arts Elective	3	4
	Tech. Elective	3	4		Tech. Elective	3	4
	Tech. Elective	3	4		Tech. Elective	3	4

Specimen Program in Electrical and Computer Engineering

First Year

Quarter 1

Quarter 2

Quarter 3

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
09.108	Comp. for Engr.	4	4	09.109	Engr. Graph. and Des.	4	4	10.152	Calculus III	4	4
10.150	Calculus I	4	4	10.151	Calculus II	4	4	11.205	Physics III	4	4
11.203	Physics I	4	4	11.204	Physics II	4	4	30.115	Gen. Chem.	4	4
30.114	Fresh. Engl. II	4	4	12.114	Gen. Chem.	4	4		Gr. Th. Lit.	4	4

Second Year

Quarter 4

Quarter 5

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
10.153	Calculus IV	4	4	10.154	Calculus V	4	4
11.286	Physics	4	4	02.163	Mech.	4	4
03.111	Circ. and Sys. I	4	4	03.112	Circ. and Sys. II	4	4
	Soc. Sci./				Soc. Sci./		
	Hum. Elec.	4	4		Hum. Elective	4	4
11.110	Physics Lab	0(3)	1	11.111	Physics Lab	0(3)	1
03.151	Elec. Engr. Lab I-A	0(4)	1	03.152	Elec. Engr. Lab I-B	0(4)	1

Third Year

Quarter 6

Quarter 7

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
10.155	Math. Anal. I	4	4	10.156	Math Analysis II	4	4
03.113	Circ. and Sys. III	4	4	03.122	Circ. and Sys. IV	4	4
03.101	Discrete Sys.	4	4	03.146	Electronics A	4	4
02.130	Therm. I	4	4	03.154	Elec. Engr. Lab II-B	0(4)	1
03.153	Elec. Engr. Lab II-A	0(4)	1		Soc. Sci./		
					Hum. Elective	4	4

Fourth Year

Quarter 8

Quarter 9

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
03.147	Electronics B	4	4	03.148	Electronics C	4	4
03.161	Electromag. Fld. Thry. I	4	4	03.162	Electromag. Fld. Thry. II	4	4
02.199	Material Sci. Soc. Sci./	4	4	03.191	Intro. Dig. Comp. I	4	4
	Hum. Elec.	4	4		Soc. Sci./		
03.155	Elec. Engr. Lab III-A		1		Hum. Elective	4	4
				03.156	Elec. Engr. Lab III-B	0(4)	1

Fifth Year

Quarter 10

Quarter 11

No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
03.175	Electromech. Dynamics	4	4		Soc. Sci./ Hum. Elective	4	4
	Soc. Sci./ Hum. Elec.	4	4		Tech. Electives	8(12)	8(12)
	Tech. Elec.	4	4				
	Tech. Elec.	4	4				
03.134	Elec. Engr. Lab IV	0(4)	2				

Note: Seven arts and sciences electives (in either social sciences or humanities) are required for graduation.

Two of these may be taken on a pass/fail basis in SEPARATE quarters. Also, four technical electives are required for graduation.

Specimen Program in Power Systems

First Year

Quarter 1

Quarter 2

Quarter 3

No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
10.150	Calculus I	4	10.151	Calculus II	4	10.152	Calculus III	4
11.203	Physics I	4	11.204	Physics II	4	11.205	Physics III	4
09.108	Comp. For Engr.	4	09.109	Engr. Graph. and Des.	4	12.115	Gen. Chem.	4
30.114	Fresh. Engl. II	4	12.114	Gen. Chem. I	4	30.115	Gr. Th. Lit.	4

Second Year

Quarter 4

Quarter 5

No.	Course	Q.H.	No.	Course	Q.H.
10.153	Calculus IV	4	10.154	Calculus V	4
11.206	Physics IV	4	02.163	Mech.	4
03.111	Circ. and Sys. I	4	03.112	Circ. and Sys. I	4
	Soc. Sci./ Hum. Elective	4		Soc. Sci./ Hum. Elective	4
03.151	Elec. Engr. Lab I-A	1	03.152	Elec. Engr. Lab I-B	1
11.110	Physics Lab I	1	11.111	Physics Lab II	1

Third Year

Quarter 6

Quarter 7

No.	Course	Q.H.	No.	Course	Q.H.
10.155	Math. Analysis I	4	10.156	Math. Analysis II	4
02.130	Therm. I	4	03.122	Circ. and Sys. IV	4
03.113	Circ. and Sys. III	4	03.146	Electronics A	4
03.101	Discrete Sys.	4		Soc. Sci./ Hum. Elective	4
03.153	Elec. Engr. Lab II-A	1	03.154	Elec. Engr. Lab II-B	1

Quarters 4 and 6 offered Fall and Winter.

Quarters 5 and 7 offered Spring and Summer

Fourth Year

Quarter 8 (Fall Only)

Quarter 9 (Spring Only)

No.	Course	Q.H.	No.	Course	Q.H.
02.131	Therm. II	4	03.162	Electromag. Fld. Thry. II	4
03.147	Electronics B	4	03.022	Elec. Power Sys. II	4
03.161	Electromag. Fld. Thry. I	4	03.148	Electronics C	4
03.221	Elec. Pwr. Sys. I	4		Soc. Sci./ Hum. Elective	4
03.115	Elec. Engr. Lab III-A		03.246	Elec. Engr. Pwr Lab I	1

Fifth Year

Quarter 10 (Winter Only)			Quarter 11 (Spring Only)		
No.	Course	Q.H.	No.	Course	Q.H.
02.236	Nuclear Engr.	4	03.191	Intro. Dig. Comp.	4
03.176	Mach. and Sys.	4	03.176	Mach. and Sys.	4
03.178	Transients in Elec. Pwr. Sys.	4		A. & S. Elective	4
	Soc. Sci./			Tech. Elective*	4
	Hum. Elective	4			
03.234	Elec. Engr. Pwr. Lab II	2			

*In Quarter 11, only one technical elective is required for graduation.

Specimen Program in General Engineering**First Year**

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
10.150	Calculus I	4	10.151	Calculus II	4	10.152	Calculus III	4
11.203	Physics I	4	11.204	Physics II	4	11.205	Physics III	4
09.108	Comp. for Engr.	4	09.109	Engr. Graph. and Des.	4	30.115	Gr. Th. Lit.	4
30.114	Fresh. Eng. II	4		Soc. Sci./			Soc. Sci./	
				Hum. Elective	4		Hum. Elective	4

Second Year

Quarter 4			Quarter 5		
No.	Course	Q.H.	No.	Course	Q.H.
10.153	Calculus IV	4	10.154	Calculus V	4
11.206	Physics IV	4		Engr. Sci. Elective	4
	Engr. Sci. Elective	4		Coord. Study	
	Soc. Sci./			Elective	4
	Hum. Elective	4		Soc. Sci./	
11.110	Physics Lab I	1		Hum. Elective	4
			11.111	Physics Lab II	1

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
	Engr. Sci. Elective	4		Engr. Sci. Elective	4
	Coord. Study			Engr. Sci. Elective	4
	Elective	4		Coord. Study	
	Coord. Study			Elective	4
	Elective	4		Soc. Sci./	
	Soc. Sci./			Hum. Elective	4
	Hum. Elective	4			

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
	Engr. Sci. Elective	4		Engr. Sci. Elective	4
	Engr. Sci. Elective	4		Engr. Sci. Elective	4
	Coord. Study			Coord. Study	
	Elective*	4		Elective	4
	Coord. Study			Coord. Study	
	Elective	4		Elective	4

Fifth Year

Quarter 10			Quarter 11		
No.	Course	Q.H.	No.	Course	Q.H.
	Engr. Sci. Elective	4		Engr. Sci. Elective	4
	Engr. Sci. Elective	4		Coord. Study	
	Coord. Study			Elective	4
	Elective	4		Coord. Study	
	Coord. Study			Elective	4
	Elective	4		Coord. Study	
				Elective	4

Note: Quarters 4, 6, 8, and 10 offered Fall and Winter; quarters 5, 7, and 9 offered Spring and Summer.

*Coordinated Study electives are courses chosen to meet the student's career objectives; these courses will be selected in conjunction with the student's adviser and are subject to the adviser's approval.

Specimen Program in Industrial Engineering

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
10.150	Calculus I	4	10.151	Calculus II	4	10.152	Calculus III	4
11.203	Physics I	4	11.204	Physics II	4	11.205	Physics III	4
09.108	Comp. for Engr.*	4	09.109	Engr. Graph.	4	12.115	Gen. Chem.	4
30.114	Fresh. Engl. II	4		and Des.*		30.115	Gr. Th. Lit.	4
			12.114	Gen. Chem.	4			

*Class of 1981 took 09.106 and 09.107.

Second Year

Quarter 4				Quarter 5			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
05.128	Work Des.	3(3)	4	05.145	Probabilistic		
10.153	Calculus IV	4	4		Analysis	4	4
11.206	Physics IV	4	4	02.165	Mech.	4	4
39.115	Economics I	4	4	10.154	Calculus V	4	4
11.110	Physics Lab I	0(3)	1	39.116	Economics II	4	4
				11.111	Physics Lab II	0(3)	1

Third Year

Quarter 6				Quarter 7			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
05.201	Prin. of Comp. and Prog. I	4	4	05.148	Statistics II	4	4
03.183	Elec. Engr. I	4	4	05.161	Operations Res. I	4	4
	Math. Elective	4	4		Engr. Sci. Elective	4	4
05.147	Statistics I	4	4	05.150	Indus. Cost Cont.	4	4

Fourth Year

Quarter 8				Quarter 9			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
05.130	Systems I	4	4	05.131	Systems II	4	4
05.240	Dig. Sim. Tech.	4	4	05.261	Engr. Econ. and		
05.163	Operations Res. II	4	4		Dec. Thry.	4	4
	Soc. Sci./				Engr. Sci. Elective	4	4
	Hum. Elec.	4	4		Soc. Sci./		
37.102	Effect. Speaking	3	3		Hum. Elective	4	4

Fifth Year

Quarter 10				Quarter 11			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
05.186	People in Organizations	4	4		Tech. Elective	4	4
	Tech. Elective	4	4		Tech. Elective	4	4
	Tech. Elective	4	4		Open Elective	4	4
	Soc. Sci./				Soc. Sci./		
	Hum. Elec.	4	4		Hum. Elective	4	4

Specimen Program in Mechanical Engineering

First Year

Quarter 1				Quarter 2				Quarter 3			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
09.108	Comp. for Engr.*	4	4	09.109	Engr. Graph and Des.*	4	4	10.152	Calculus III	4	4
10.150	Calculus I	4	4					11.205	Physics III	4	4
11.203	Physics I	4	4	10.151	Calculus II	4	4	30.115	Gr. Th. Lit.*	4	4
30.114	Fresh. Engl. II*	4	4	11.204	Physics II	4	4	12.115	Gen. Chem.*	4	4
				12.114	Gen. Chem.*	4	4				

*First-year pattern of two-term courses may vary according to assigned section.

Second Year

Quarter 4				Quarter 5			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
02.165	Mech. I	4	4	02.167	Mech. II	4	4
10.153	Calculus IV	4	4	02.130	Therm. II	4	4
11.206	Physics IV	4	4	10.154	Calculus V	4	4
11.110	Physics Lab I	0(3)	1	11.111	Physics Lab II	0(3)	1
39.115	Prin. and Prob. of Econ.	4	4		Soc. Sci./ Hum. Elective	4	4

Third Year

Quarter 6				Quarter 7			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
02.131	Therm. II	4	4	02.155	Fluid Mech. I	4	4
02.166	Mech. III	4	4	02.196	Materials Sci.*	4(3)	5
02.192	Meas. and Analysis*	0(3)	4	10.156	Math. Analysis II	4	4
10.155	Math. Anal. I	4	4	02.168	Mech. IV	4	4

*Given in Quarters 6 and 7.

Fourth Year

Quarter 8				Quarter 9			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
	Tech. Elective	4	4	02.150	Heat Transfer I	4	4
	Tech. Elective	4	4	02.176	Dynamics	4	4
	Tech. Elective	4	4		Tech. Elective	4	4
	Soc. Sci./ Hum. Elec.	4	4		Soc. Sci./ Hum. Elective	4	4

Fifth Year

Quarter 10				Quarter 11			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
	Tech. Elective	4	4		Tech. Elective	4	4
	Tech. Elective	4	4		Tech. Elective	4	4
	Tech. Elective	4	4		Tech. Elective	4	4
	Soc. Sci./ Hum. Elec.	4	4		Soc. Sci./ Hum. Elective	4	4

Elective requirements for the junior and senior years (B.S. in M.E.)

Juniors and seniors will select ten (10) technical and four (4) arts and sciences electives, subject to the following Department restrictions:

A. Arts and Sciences electives (four):

Must be selected from a Department-approved list of humanities and/or social science courses, which is available during preregistration.

B. Required technical electives:

1. 03.183 Electrical Engineering I (Fall, Winter)
2. 02.197 Mechanical Behavior of Materials (Fall, Winter), or
02.198 Materials Processing (Spring, Summer)
- 3a. 02.146 Mechanical Engineering Design (Prereq. 02.145) Fall, Winter, or
02.147 Engineering Design (Classes of 1983 and 1984)
- 3b. 02.146 Mechanical Engineering Design (Prereq. 02.145) and
02.260 Heat and Mass Transfer Design (Prereq. 02.150) (Starts with class of 1985)

C. Additional technical electives:

The remaining technical electives should be chosen after consideration of your professional career objectives and must be approved by your adviser during preregistration in the Department. The majority of these courses must be selected from the Mechanical Engineering elective course offerings. The student's area of concentration determines the recommended courses from which he or she is to choose electives.

Specimen B.S./M.S. Program in Mechanical Engineering

During the first two years of study, students enrolled in the B.S./M.E. Program in Mechanical Engineering pursue a curriculum similar to that of the regular M.E. Program.

Third Year

Quarter 6				Quarter 7			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
02.131	Therm. II	4	4	02.155	Fluid Mech.	4	4
02.166	Mech. III	4	4	02.196	Materials Sci.	4(3)	5
02.192	Meas. and Analysis	2(3)	4	02.168	Mech. IV	4	4
10.155	Math Analysis	4	4	10.156	Math Analysis	4	4
	Soc. Sci./Hum. Elective	4	4		Soc. Sci./Hum. Elective	4	4

Fourth Year

Quarter 8				Quarter 9			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
	Tech. Elective	4	4	02.150	Heat Transfer I	4	4
	Tech. Elective	4	4	02.176	Dynamics	4	4
	Tech. Elective	4	4		Tech. Elective	4	4
	Soc. Sci./Hum. Elective	4	4		Soc. Sci./Hum. Elective	4	4
	Grad. Elective	2	2		Grad. Elective	2	2
02.826	Math Methods I	2	2	02.827	Math. Methods II	2	2

Fifth Year

Quarter 10				Quarter 11				Quarter 12			
No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.	No.	Course	Cl.	Q.H.
	Grad. Elective	8	8		Grad. Elective	8	8		Thesis	6	6
	Tech. Elective	4	4		Tech. Elective	4	4		Tech. Elective	4	4
	Tech. Elective	4	4		Tech. Elective	4	4		Tech. Elective	4	4
	Seminar	1	1		Seminar	1	1		Grad. Elective	4	4
									Grad. Elective	4	4

Note: Technical elective requirements are the same as those for the regular Mechanical Engineering program.

Specimen Program in Computer Science

Third Year

Quarter 6			Quarter 7		
No.	Course	Q.H.	No.	Course	Q.H.
10.246	Lin. Algebra	4	05.145	Probability [†]	4
06.220	File Structures	4	06.230	Operating Sys.	4
03.192	Comp. Org. & Des.	4		Coordinated Study	4
	Coordin. Study	4		Soc. Sci./Hum.	4

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Q.H.	No.	Course	Q.H.
05.147	Statistics I [†]	4	06.260	Compiler Des. I	4
06.240	Analysis of Prog. Lang.	4	06.265	Anal. of Algorithms	4
06.250	Automata and Formal Lang.	4		Coordinated Study	4
	Soc. Sci./Hum.	4		Soc. Sci./Hum.	4

Fifth Year

Quarter 10			Quarter 11		
No.	Course	Q.H.	No.	Course	Q.H.
	Comp. Sci. Elect. [†]	4		Coordinated Study	4
	Coordin. Study	4		Coordinated Study	4
	Coordin. Study	4		Soc. Sci./Hum.	4
06.291	Comp. Sci. Proj.	4	06.296	Comp. Sci. Sem.	4

[†]Students interested in the theoretical aspects of computer science should substitute 10.208 and 10.220.

06.280 Artificial Intelligence, 06.210 Computer Graphics, or 06.225 Data Base Management I.

Lincoln College

Specimen Program in Electrical Engineering Technology

First Year

Quarter 1			Quarter 2			Quarter 3		
No.	Course	Cl. Q.H.	No.	Course	Cl. Q.H.	No.	Course	Cl. Q.H.
10.407	Col. Alg. and Trig. I	4 4	10.408	Col. Alg. and Trig. II	4 4	10.420	Calculus I	4 4
11.417	Physics I	4 4	11.418	Physics II	4 4	11.419	Physics III	4 4
30.113	Fresh. Engl. I	4 4	30.114	Fresh. Engl. II	4 4	30.206	Prof. Writing	4 4
09.421	Graphics I	4 4	09.400	Comp. Prog.	4 4	09.471	Graphics II	4 4
			11.473	Physics Lab I	2 2	11.474	Physics Lab II	2 2

Second Year

Quarter 4			Quarter 5		
No.	Course	Cl. Q.H.	No.	Course	Cl. Q.H.
10.421	Calculus A	4 4	10.422	Calculus B	4 4
03.451	Circ. Analysis I	4 4	03.452	Circ. Analysis II	4 4
39.115	Economics	4 4	02.419	Mechanics	4 4
	Soc. Sci.	4 4		Soc. Sci.	4 4
			03.424	Cir. Lab I	2 2

Third Year

Quarter 6			Quarter 7		
No.	Course	Cl. Q.H.	No.	Course	Cl. Q.H.
03.460	Eng. Analysis I	4 4	03.454	Circ. Analysis IV	4 4
03.453	Circ. Analysis III	4 4	03.412	Electronics II	4 4
03.411	Electronics I	4 4	03.410	Electrical Meas.	4 4
03.425	Circ. Lab II	2 2	03.423	Electronic Lab	4 4
03.430	Energy Conv.	4 4			

Fourth Year

Quarter 8			Quarter 9		
No.	Course	Cl. Q.H.	No.	Course	Cl. Q.H.
03.413	Electronics III	4 4	03.428	Adv. Electronic Lab II	2 2
03.427	Adv. Electronic Lab I	2 2		Tech. Elective	4 4
	Tech. Elective	4 4	03.414	Pulse & Dig. I	4 4
	Soc. Sci.	4 4		Soc. Sci.	4 4
			05.437	Dist. Syst.	4 4

Fifth Year

Quarter 10

No.	Course	Cl.	Q.H.
03.429	Adv. Electronic Lab II	2	2
	Tech. Elective		4
03.477	Cont. Sys. I		4
03.470	Dig. Comp. I		4

Quarter 11

No.	Course	Cl.	Q.H.
	Tech. Elective	4	4
03.478	Cont. Sys. II		4
03.471	Dig. Comp. II		4
	Soc. Sci.		4

Technical Elective Sequences

(A) Power Systems Sequence

No.	Course	Q.H.
03.462	Bas. Pwr. Sys. I	4
03.463	Bas. Pwr. Sys. II	4
03.464	Bas. Pwr. Sys. III	4
	Tech. Elective	4

(B) Communications Engineering Sequence

No.	Course	Q.H.
03.417	Prin. of Com. Sys I	4
03.418	Prin. of Com. Sys II	4
03.419	Prin. of Com. Sys III	4
	Tech. Elective	4

Specimen Program in Mechanical Engineering Technology

First Year

Quarter 1

No.	Course	Cl.	Q.H.
10.407	Col. Alg. and Trig. I	4	4
30.113	Fresh Eng. I	4	4
09.470	Engineering Graphics I or		
09.400	Prin. of Comp. Prog. 1	4	4

Quarter 2

No.	Course	Cl.	Q.H.
10.408	Col. Alg. and Trig. II	4	4
30.114	Fresh. Eng. II	4	4
09.400	Prin. of Comp. Prog. 1 or		
09.470	Engineering Graphics I	4	4

Quarter 3

No.	Course	Cl.	Q.H.
10.420	Calculus I	4	4
30.206	Lit. of Engineering	4	4
09.471	Engineering Graphics II	4	4

Second Year

Quarter 4

No.	Course	Cl.	Q.H.
10.421	Calculus A	4	4
02.411	Mechanics A	4	
03.420	Electricity & Electronics	4	4

Quarter 5

No.	Course	Cl.	Q.H.
10.422	Calculus B	4	4
02.412	Mechanics B	4	4
02.414	Stress Anal. A. & S. Elective I	4	4

Third Year

Quarter 6

No.	Course	Cl.	Q.H.
02.415	Stress Anal. B	4	4
02.473	Meas. & Anal. Lab	2	2
02.421	Thermodynamics A	4	4
02.413	Mechanics C	4	4
39.115	Econ. Prin. & Probs.	4	4

Quarter 7

No.	Course	Cl.	Q.H.
02.431	Materials A	4	4
02.474	Technol. Lab A	2	2
02.422	Thermodynamics B	4	4
02.443	Fluid Mech. A	4	4

Fourth Year

Quarter 8

No.	Course	Cl.	Q.H.
02.480	Mech. Design A	4	4
02.475	Tech. Lab B	2	2
02.444	Fluid Mechanics B	4	4
02.461	Machine Shop (Indus. Engr. Elec. on petition with experience)	4	4
	A. & S. Elec.	4	4

Quarter 9

No.	Course	Cl.	Q.H.
02.481	Mech. Design B	4	4
02.476	Tech. Lab C	2	2
02.423	Refrig. & Air Cond.	4	4
	A. & S. Elective I	4	4

Fifth Year

Quarter 10

No.	Course	Cl.	Q.H.
02.477	Tech. Lab. D	2	2
05.460	Engr. Economy	4	4
	A. & S. Elec. I	4	4
	Tech. Elec. I	4	4
02.432	Materials B or	4	4
02.416	Stress Anal. C	4	4

Quarter 11

No.	Course	Cl.	Q.H.
02.478	Tech. Lab E	2	2
02.430	Heat Transfer	4	4
	Tech. Elec. I	4	4
	A. & S. Elec. I	4	4

No.	Course	Cl.	Q.H.
-----	--------	-----	------

Technical electives must be chosen from the following list:

02.418	Stress Analysis C	4
02.452	Exp. Stress Analysis	4
02.451	Mech. Vibrations	4
02.432	Materials B	4
02.433	App. Metallurgy	4
02.479	Power Gen.	4
10.423	Differential Equations	4
03.421	Electricity and Electronics	4
03.490	Optical instrumentation	4
04.481	Nuclear Technology	4

Specimen Program in Computer Technology

First Year

Quarter 1

No.	Course	Q.H.
10.407	Alg. & Trig. I	4
11.417	Physics I	4
30.113	Fresh. Eng. I	4
09.470	Eng. Graph. I	4
		16

Quarter 2

No.	Course	Q.H.
10.408	Alg. & Trig. II	4
11.418	Physics II	4
30.114	Fresh. Eng. II	4
09.405	Intro. to Prog.	4
11.473	Physics Lab I	2
		18

Quarter 3

No.	Course	Q.H.
10.420	Calculus I	4
11.419	Physics III	4
30.206	Lit. of Engineering	4
09.450	Basic Comp. Organ	4
11.474	Physics Lab II	2
		18

Second Year

Quarter 4

No.	Course	Q.H.
10.421	Calculus A	4
03.451	Circuits Anal. I	4
39.115	Economics I	4
09.410	Fortran	4
		16

Quarter 5

No.	Course	Q.H.
10.422	Calculus B	4
03.452	Circuits Anal. II	4
09.468	Semiconductor Logic	4
	SS/HUM	4
		16

Third Year

Quarter 6

No.	Course	Q.H.
03.411	Electronics I	4
09.440	Mod Prog. Tech.	4
09.469	Computer Logic	4
09.420	COBOL	4
		<u>16</u>

Quarter 7

No.	Course	Q.H.
09.445	Assembly Lang.	4
09.474	Intro. to CPU Hdwre	4
09.451	Adv. Comp. Organ	4
	SS/HUM	4
		<u>16</u>

Fourth Year

Quarter 8

No.	Course	Q.H.
09.475	CPU Hdwre Arch.	4
09.430	Non-num. Algo.	4
09._____	Comp. Tech. Elective	4
	SS/HUM	4
		<u>16</u>

Quarter 9

No.	Course	Q.H.
09.455	Micro-Peri. Hdwre.	4
09.435	Num. Algorithms	4
09.480	Data Comm. Methods	4
09._____	Comp. Tec. Elective	4
		<u>16</u>

Fifth Year

Quarter 10

No.	Course	Q.H.
09._____	Comp. Tech. Elective	4
09.460	Ind. Software	4
	Tech. Elective	4
	SS/HUM	4
		<u>16</u>

Quarter 11

No.	Course	Q.H.
09.465	Ind. Hdwre.	4
09.456	Comp. Peri. Hdwre	4
	SS/HUM	4
	Technical Elect	4
		<u>16</u>

College of Nursing

Specimen Program for Baccalaureate Degree in Nursing

First Year

Quarter 1

No.	Course	Cl.	L.	Q.H.
18.141	Bas. Ani. Bio. I	3	4	4
23.101	Western Civ.	3		4
30.113	Fresh Eng. I	4		4
80.217	Nursing	4		4

Quarter 2

No.	Course	Cl.	L.	Q.H.
12.106	Gen. Chem.	4	3	5
18.142	Bas. Ani. Bio. II	3	4	4
30.114	Fresh. Eng. II	4		4
80.218	Nursing	4		4

Quarter 3

No.	Course	Cl.	L.	Q.H.
12.104	Gen. Chem.	4	3	5
18.148	Hum. Anal.	3	3	4
23.102	Western Civ. II	4		4
80.219	Nursing	4		4

Second Year

Quarter 4

No.	Course	Cl.	L.	Q.H.
18.120	Bas. Microbio.	3	4	4
18.143	Hum. Physiol	3	3	4
19.105	Fnd. Psych	4		4
80.220	Nursing	4	6	6

Quarter 5

No.	Course	Cl.	L.	Q.H.
18.144	Hum. Physiol I	3	3	4
19.106	Fnd. Psych. I	4		4
20.100	Soc. Anthro.	4		4
80.221	Nursing	4	6	6

Third Year

Quarter 6

No.	Course	Cl.	L.	Q.H.
Section I				
19.141	G and D I	4		4
19.130	Soc. Psych.	4		4
83.202	Psych. Nursing	4	9	7

Quarter 7

No.	Course	Cl.	L.	Q.H.
Section I				
19.142	G and D II	4		4
21.100	Sociology	4		4
73.116	Pharmac	3		3
80.207	Nursing	5	6	7

No.	Course	Cl.	L.	Q.H.
Section II				
19.141	G and D I	4		4
73.116	Pharmacol.		3	
21.100	Sociology	4		4
80.207	Nursing	5	6	7

No.	Course	Cl.	L.	Q.H.
Section II				
19.142	G and D II	4		4
19.130	Soc. Psych.	4		4
83.202	Psych. Nurs	4	9	7

Fourth Year

Quarter 8					Quarter 9				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
82.201	Mat. Child Nur.*	4	15	9	81.201	Med. Surg.			
	Hum. Elective	4		4		Nursing*	4	15	9
	Gen. Elective	4		4		Hum. Elective	4		4
						Gen. Elective	4		4

Fifth Year

Quarter 10					Quarter 11				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
84.201	Com. Hlth. Nur.	5	12	9	85.201	Contemp. Nur.	2	21	9
	Elective	4		4		Elective	(4)		(4)
	Elective	4		4		(if desired)			

* Each of these courses is offered in Quarters 8 and 9, but only one is to be taken per quarter.

179 Q.H. = Minimum graduation requirement.

Degrees

The College of Nursing offers a five-year program leading to the Bachelor of Science degree in Nursing, and Registered Nurse day and evening programs leading to the Bachelor of Science degree in Nursing. The length of these programs varies, depending on the individual's interest and ability to achieve advanced placement.

Quantitative Requirements

Candidates for the Bachelor of Science degree must successfully complete all of the prescribed courses in the applicable curriculum. For the Bachelor of Science degree this totals 179 quarter hours. The prescribed periods of cooperative work at health agencies associated with the University are not required of the Bachelor of Science Programs for Registered Nurses.

College of Pharmacy and Allied Health Professions

Specimen Program in Pharmacy (Five-Year Cooperative)

First Year

Quarter 1					Quarter 2					Quarter 3				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
	Electives			8	18.131	Gen. Bio.	3	4	4	71.259	Bas. Pharmacy	3		3
10.104	Fund. Math.*	4		4	10.105	Funct. and Bas. Cal.*	4		4	12.119	Gen. Chem.†	4	3	5
10.105	Funct. and Bas. Cal.*	4		4	10.107	Calculus*	4		4	18.132	Ani. Bio.	3	4	4
12.106	Gen. Chem.	4	3	5	30.113	Fresh. Eng. I	4		4	30.114	Fresh. Eng. II	4		4
					87.135	Prof. Dynamics in Health Care Deliv. Sys.	4		4					

* Minimum math requirement: 10.107.

† 12.127, 12.128, General Chemistry, may be taken in place of 12.119, but one year of high school calculus is recommended.

Second Year

Quarter 4 (Entire Class) (Sept.-Dec.)					Quarter 4A (Entire Class) (Jan.-March)					Quarter 5 (April-June & June-Sept.)				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
11.171	Physics I	4		4	11.175	Physics III	4		4	73.202	Anat. & Physiology I	4	(3)	5
12.144	Organic Chem.	4	(3)	5	12.145	Organic Chem. A. & S.	4	(3)	5	93.156	Bio. Chem.	5		5
21.107	Soc. Psych.‡	4		4		Electives	8		8		A. & S. Electives	8		8
	A. & S. Elective			4										

‡ 21.107 may be taken during any quarter of the second year.

Third Year

Quarter 6

No.	Course	Cl.	L.	Q.H.
71.140	Pharmaceutics	4		4
72.135	Anti-infectives Struc. & Action	5		5
73.204	Anat. & Phys. II	4	(3)	5
72.263	Med.Chem./ Pharmacol. I	4		4

Quarter 7

No.	Course	Cl.	L.	Q.H.
71.141	Pharmaceutics	5		5
73.245	Pathology	4		4
73.229	Pharmacol. Lab. I	0	(3)	1
71.142	Pharmaceu. L.	1	(3)	2
73.264	Pharmacol. Med./Chem. II	6		6

Fourth Year

Quarter 8

No.	Course	Cl.	L.	Q.H.
73.265	Pharmacol. Med./Chem. III	6		6
71.264	Bioph./P'kin.	4		4
73.230	Pharmacol. Lab. II	0	(3)	1
73.230	Drug Analysis	4	(3)	5

Quarter 9 (Entire Class)
(April-June)

No.	Course	Cl.	L.	Q.H.
73.247	Toxicology	4		4
71.288	Non-Prescription Medication	4		4
71.268	Clin. Pharmacol. therapeutics	5		5
71.269	Pharmacokinetic Prin. in Drug Therapy	4		4

Fifth Year

Quarter 10
(Summer)

No.	Course	Q.H.
71.255	Clin. Pharm. Clerkship	15
71.200	Pharm. Externship	4
71.227	Parapharmaceuticals	2
71.284	Prof. Practice Lab	1
71.245	Pharm. Admin.	4
71.220	Interper. Skills for Health Professionals	4
71.249	Drug Info. and Eval.	3
	Prof. Elective	4
		18

Quarter 11
(Fall)

No.	Course	Q.H.
71.255	Clin. Pharm. Clerkship	15
71.200	Pharm. Externship	4
71.243	Pharm. Jurisprudence	4
71.296	Community Pharm. Mgmt. or	4
71.244	Hospital Pharm. Mgmt.	4
71.218	Caring for Patients: Psychosocial Aspects of Illness	4
	Prof. Elective	4
		16

Quarter 12
(Winter)

No.	Course	Q.H.
71.255	Clin. Pharm. Clerkship	15
71.200	Pharm. Externship	4
71.227	Parapharmaceuticals	2
71.284	Prof. Practice Lab	1
71.245	Pharm. Admin.	4
71.220	Interper. Skills for Health Professionals	4
71.249	Drug Info. and Eval.	3
	Prof. Elective	4
		18

Quarter 13
(Spring)

No.	Course	Q.H.
71.255	Clin. Pharm. Clerkship	15
71.200	Pharm. Externship	4
71.243	Pharm. Jurisprudence	4
71.296	Community Pharm. Mgt. or	4
71.244	Hospital Pharm. Mgt.	4
71.218	Caring for Patients: Psychosocial Aspects of Illness	4
	Prof. Elective	4
		16

NOTES: About one quarter of the class will be in 71.255, one quarter in 71.200, and one half in the classroom for each quarter.

Students must take a total of 8 credits for professional electives. All 8 credits may be taken in one quarter or as outlined above.

Specimen Program in Dental Hygiene*

First Year

Quarter 1					Quarter 2					Quarter 3				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
12.111	Gen. Chem.	3	(3)	4	12.112	Gen. Chem.	3	(3)	4	18.120	Bas. Microbio.	3	(4)	4
18.114	Human Anat. & Physiology I	4	(3)	5	18.115	Human Anat. & Physiology II	4	(3)	5		Prof. Courses		(4)	
	Prof. Courses					Prof. Courses								

Second Year

Quarter 4					Quarter 4A					Quarter 5				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
30.113	Fresh. Eng. I	4		4	19.105	Fnd. Psych. I	4		4	21.100	Intro. Soc.	4		4
	Prof. Courses					Prof. Courses				30.114	Fresh. Eng. II	4		4
											Prof. Courses			

* Students are admitted directly to the Forsyth School for Dental Hygienists and should contact the School for catalogs, applications, and complete program information by writing to:
 Forsyth School for Dental Hygienists
 140 The Fenway
 Boston, Massachusetts 02115

Specimen Program in Medical Laboratory Science

(Five-Year Cooperative)

First Year

Quarter 1					Quarter 2					Quarter 3				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
10.104	Fund. Math. or				10.105	Func. Calculus or				30.114	Fresh. Engl. II	4		4
10.105	Func. Calculus	4		4	10.107	Calculus	4		4	87.150	Basic MLS I	2	(3)	3
12.106	Gen. Chem. I	4	(3)	5	12.119	Gen. Chem. II	4	(3)	5	12.171	Analyt. Chem.	3	(3)	4
18.131	Gen. Bio.	3	(3)	4	18.132	Anim. Bio.	3	(4)	4		Elective	4		4
30.113	Fresh. Engl. I	4		4	87.135	Prof. Dyn.	4		4		Elective	4		4
87.100	Med. Lab. Orien.	1		1										

Second Year

Quarter 4 Entire Class*					Quarter 4A Entire Class*					Quarter 5*				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
12.144	Org. Chem. I	4	(3)	5	87.113	Clin. Immunology	2	(3)	3	12.145	Oreg. Chem. II	4	(3)	5
18.143	Humn. Physio. I	3	(3)	4	87.151	Hematology I	2	(3)	3	18.144	Humn. Physio. II	3	(3)	4
87.154	Microbiology	4	(6)	8	87.152	Hematology II	2	(3)	3	87.155	Clin. Chem.	4	(3)	5
	Elective	4		4	87.153	Immunohematology	2	(3)	3		Elective	4		4
						Elective	4		4					

* Depending on group assignment, this is a sample of the second year.

*MLT applies for clinical.

* Regular co-op sequence starts here.

Third Year

Quarter 6*					Quarter 7				
No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
18.135	Genetics	3	(4)	4	11.172	Physics II	4		4
11.171	Physics I	4		4	18.136	Cell. Phys. Bio.	3	(4)	4
11.173	Physics Lab		(3)	1	18.221	Gen. Micro.	3		3
87.206	Parasitology	2	(3)	3	87.116	Clin. Mycology	2	(3)	3
	Elective	4		4	11.174	Physics Lab		(3)	1
						Elective	4		4

* M.T. applies for Clinical.

Fourth Year

Quarter 8

No.	Course	Cl.	L.	Q.	H.
87.224	Clin. Micro. II <i>and</i>	2		2	
87.225	Clin. Chem. II <i>and</i>	2		2	
87.232	Hematology III <i>or</i>	3		3	
87.234	Clin. Micro. III <i>and</i>	2		2	
87.235	Clin. Chem. III <i>and</i>	2		2	
87.253	Immunohematology	2		2	
87.166	Hematology AS <i>and</i>	(20)		4	
87.167	Immunohem. AS <i>or</i>	(12)		3	
87.168	Clin. Micro. AS <i>or</i>	(32)		7	
87.169	Clin. Chem. AS	(32)		7	

Quarter 9

No.	Course	Cl.	L.	Q.	H.
87.166	Hematology AS <i>and</i>	(20)		4	
87.167	Immunohema AS <i>or</i>	(12)		3	
87.168	Clin. Micro. AS <i>or</i>	(32)		7	
87.169	Clin. Chem. AS	(32)		7	
87.242	Hematology IV	2		2	
87.244	Clin. Micro. IV	2		2	
87.245	Clin. Chem. IV	2		2	
87.280	MLS Special Topics	2		2	

Fifth Year

Quarter 10

No.	Course	Cl.	L.	Q.	H.
87.166	Hematology AS <i>and</i>	(20)		4	
87.167	Immunohem AS <i>or</i>	(12)		3	
87.168	Clin. Micro. AS <i>or</i>	(32)		7	
87.169	Clin. Chem. AS	(32)		7	
87.234	Clin. Micro. III <i>and</i>	2		2	
87.253	Immunohematology <i>and</i>	2		2	
87.235	Clin. Chem. III <i>or</i>	2		2	
87.224	Clin. Micro. II <i>and</i>	2		2	
87.225	Clin. Chem. II <i>and</i>	2		2	
87.232	Hematology	3		3	

Quarter 11

No.	Course	Cl.	L.	Q.	H.
87.281	MLS Sen. Sem.	2		2	
87.221	Med. Lab Mgmt.	2		2	
87.226	Hlth. Sci. Ed.	2		2	
	Prof. Elective	2-4		2-4	
	Elective	4		4	

Elective Distribution Requirements:

12 QH of Humanities.

8 QH of Social Sciences and 4 QH of Professional Dynamics; or 12 QH Social Sciences.

14-16 QH of other electives including at least one Professional Elective.

Specimen Program in Health Record Administration
(Five-Year Cooperative)

First Year

Quarter 1

No.	Course	Cl.	L.	Q.	H.
10.101	Bas. Math	4		4	
18.131	Gen. Bio.	3	(3)	4	
19.105	Fnd. Psych. I	4		4	
30.113	Fresh. Eng. I	4		4	
86.158	Orient. Med. Rec. I	1		1	

Quarter 2

No.	Course	Cl.	L.	Q.	H.
10.102	Bas. Math	4		4	
18.132	Anim. Bio.	3	(4)	4	
22.110	Intro. Pol. <i>or</i> Modern Lang.	4		4	
87.135	Dynam. of Hlth. Care	4		4	

Quarter 3

No.	Course	Cl.	L.	Q.	H.
18.121	Intro. Microbio.	3		3	
19.106	Fnd. Psych. II	4		4	
30.114	Fresh. Eng. II	4		4	
22.111	Intro. Amer. Gov't <i>or</i> Modern Lang.	4		4	

Second Year

Quarter 4

No.	Course	Cl.	L.	Q.	H.
18.114	Func. Hum. Anat. I	4	(3)	5	
21.100	Intro. Socio.	4		4	
23.101	West. Civ. <i>or</i>	4		4	
39.115	Prin. & Prob. <i>or</i> Econ.	4		4	
86.159	Orient. Med. Rec. II Elective	1		1	
		4		4	

Quarter 5

No.	Course	Cl.	L.	Q.	H.
10.108	Prob. Stat. & Computer	4		4	
18.115	Func. Hum. Anat.	4	(3)	5	
23.102	West. Civ. <i>or</i>	4		4	
39.116	Prin. & Prob. Econ. <i>or</i>	4		4	
39.130	Med. Econ.	4		4	
45.209	OB I	4		4	

Third Year**Quarter 6**

No.	Course	Cl.	L.	Q.H.
86.102	Hosp. Law	2		2
86.107	Med. Term.	4		4
86.112	Fnd. Med. Sci. I	3		3
86.151	Hlth. Rec. Sci. I	3	(3)	4
	Commun.	4		4

Quarter 7

No.	Course	Cl.	L.	Q.H.
86.113	Fnd. Med. Sci. II	3		3
86.152	Hlth. Rec. Sci. II	3	(3)	4
86.160	Intro. DP for Hlth. Sci.	4		4
86.162	Mngt. Prin. Hlth. Care Elective	4		4

Fourth Year**Quarter 8**

No.	Course	Cl.	L.	Q.H.
86.153	Hlth. Rec. Sci. III	3	(3)	4
86.166	Appl. Hlth. Stat.	4		4
86.173	Clin. Sem. (15 days)	2		2
86.260	Appl. Hlth. Rec. Dir. Pract. I	3		3
86.265	Org. & Mngt. Med. Rec. Dp. I	4		4

Quarter 9

No.	Course	Cl.	L.	Q.H.
86.154	Hlth. Rec. Sci. IV	3	(3)	4
86.161	Qual. Assur.	4		4
86.163	Sys. Anal.	4		4
86.268	Appl. Hlth. Rec. Dir. Pract. II (7 days)	2		2
86.266	Org. & Mngt. Med. Rec. Dp. II	4		4

Fifth Year**Quarter 10**

No.	Course	Cl.	L.	Q.H.
86.168	Med. Comp. Appl.	4		4
86.267	Org. & Mngt. Med. Rec. Dp. III	4		4
87.226	Hlth. Sci. Ed. Elective	2		2
		4		4

Quarter 11

No.	Course	Cl.	L.	Q.H.
86.157	Sem. Hlth. Rec.	2		2
86.167	Hlth. Rec. Prof.	2		2
86.169	Indep. Study	4		4
86.264	Appl. Hlth. Rec. Sci. III	4		4
86.164	Spec. Topics I*			2
86.165	Spec. Topics II*			2

* Assigned by Program Director

**Specimen Program in Respiratory Therapy B.S.
(Five-Year Cooperative)****First Year****Quarter 1**

No.	Course	Q.H.
10.104	Fund. Math.	4
12.106	Gen. Chem.	4 (3)
18.141	Bas. Ani. Bio.	3 (3)
30.113	Fresh. Engl. II	4
86.211	Resp. Ther. Sem. I	1

Quarter 2

No.	Course	Q.H.
10.105	Func. and Bas. Calc.	4
18.142	Bas. Ani. Bio. II	3 (4)
11.136	Bas. Physics	3
86.103	Bas. Med. Term.	2
86.212	Resp. Ther. Sem. II	1
87.135	Prof. Dynamics in the Hlth Care Delivery Sys.	4

Quarter 3

No.	Course	Q.H.
30.114	Fresh. Engl. II	4
12.119	Gen. Chem.	4 (3)
18.120	Microbio.	3 (4)
86.213	Resp. Ther. Sem. III A & S Elective	1

Second Year**Quarter 4**

No.	Course	Cl.	L.	Q.H.
73.202	Anat. Physiol. I	4	(3)	5
86.201	Prof. Prac. Lab I		(3)	1
86.190	Intro. Patient Care	4		4
86.226	Cardio. Pul. Phys. A. & S. Elective	4		4

Quarter 4A

No.	Course	Cl.	L.	Q.H.
73.117	Pharmacol./ Resp. Care	4		4
73.204	Anat. Physiol. II		(3)	5
86.202	Prof. Prac. Lab. II		(3)	1
86.191	Intro. Resp. Care	4		4
86.227	Cardio-Pul. Dis.	4		4

Quarter 5

No.	Course	Cl.	L.	Q.H.
86.203	Prof. Prac. Lab. III		(3)	1
86.214	Clin. Sem. I	1		1
86.233	Resp. Care/ Med. Surg.	4		4
86.112	Fund. Med. Sci. I	3		3
86.228	Clin. Prac. I		(24)	6

Third Year**Quarter 6****Quarter 7****

No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
86.102	Hosp. Law	2		2	86.205	Cardio.-Pul.			
86.204	Prof. Prac. Lab. IV		(3)	1		Lab. Prac.	(3)		1
86.229	Clin. Prac. II		(24)	6	86.195	Cardio.-Pul.			
						Tech.	4		4
86.215	Clin. Sem. II	1		1	86.281	Pediatrics	2		2
86.234	Resp. Care/ Crit. Patient	4		4		A. & S. Electives			8

Fourth Year**Quarter 8****Quarter 9**

No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
12.144	Organic Chem. I	4	(3)	5	12.145	Organic Chem. II	4	(3)	5
86.216	Adv. Resp. Thry. Sem. I	1		1	86.217	Adv. Clin. Sem. II	1		1
86.271	Adv. Life Sup. Sys. I	4		4	86.274	Adv. Clin. Phys.	4		4
86.278	Adv. Med. Monit.	4		4		Prof. Elective			4

Fifth Year**Quarter 10****Quarter 11**

No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
86.218	Adv. Clin. Sem. III	1		1	86.219	Adv. Clin. Sem. IV	1		1
86.276	Neonatology	4		4	86.288	Practicum	(16)		4
86.277	Dir. Study			2		A & S. Electives			8
86.287	Practicum Prof. Elective	4	(16)	4	86.289	Dir. Study			2

Specimen Program in Toxicology (Five-Year Cooperative)

First Year**Quarter 1****Quarter 2****Quarter 3**

No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
10.104	Math	4		4	10.105	Math	4		4	10.107	Calculus	4		4
	Elective	4		4	12.106	Gen. Chem.	4	(3)	5	30.114	Fresh. Engl. II	4		4
18.131	Gen. Bio. I	2	(4)	4	18.132	Gen. Bio. II	3	(4)	4		Elective	4		4
30.113	Fresh. Engl. I	4		4	73.130	Tox. Orient.	1		1	12.119	Gen. Chem.	4	(3)	5
					87.135	Prof. Dynamics in Hlth. Care Delivery System	4		4					

Second Year**Quarter 4****Quarter 4A (entire class)****Quarter 5**

No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
11.171	Physics	4		4	11.175	Physics	4		4	93.156	Gen. Biochem.	5		5
12.144	Org. Chem.	4	(3)	5	12.145	Org. Chem.	4	(3)	5	10.108	Prob. Stat.	4		4
73.202	Anat. & Phys. I	4	(3)	5	73.204	Anat. & Phys. II	5	(3)	5	01.197	Sur. Env. Prob. or Elective	4		4
	Elective	4		4							Elective	4		4

Third Year**Quarter 6****Quarter 7**

No.	Course	Cl.	L.	Q.H.	No.	Course	Cl.	L.	Q.H.
18.120	Micro	3	(4)	4	73.264	Pharmacol			
72.263	Med. Chem. Pharmacol I	4		4		Med. Chem. II	6		6
72.261	Id. Abuse Drugs	2	(6)	4	12.253	Id. of Org. Comp.	1	(6)	3
01.197	Survey Env. Prob. or Elective	4		4	73.247	Toxicology I	4		4
					73.229	Pharmacol. Lab	(3)		1

Fourth Year**Quarter 8**

No.	Course	Cl.	L.	Q.H.
73.265	Pharmacol Med. Chem. III	6		6
73.230	Pharmacol. Lab. II	0	(3)	1
73.253	Tox. II-Fund. Prin. of Tox.	4		4
73.256	Tox. Lab.	0	(3)	1
72.230	Drug Analysis	4	(3)	5

Quarter 9

No.	Course	Cl.	L.	Q.H.
73.261	Special Topics	4		4
87.155	Basic MLS Clin. Chem. & Instru.	4	(3)	5
73.247	Tox. I or Elective	4		4
73.245	Pathology	4		4

Fifth Year**Quarter 10**

No.	Course	Cl.	L.	Q.H.
73.254	Tox. III	4		4
73.215	Drug Interactions	4		4
71.264	Bio. Pharm./ Pharm.	4		4
12.179	Inst. Analysis	3	(6)	5

Quarter 11

No.	Course	Cl.	L.	Q.H.
65.219	Comm. Health Elective	4	4-8	4
	Tox Colloq.	3		3
25.180	Epidemiology	4		4

University College

Alternative Freshman-Year Program

Business Track: One-Year Program**Quarter 1****Quarter 2****Quarter 3**

No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
10.100	Math. I*	4	10.110	Math. II*	4	10.118	Col. Math.	
30.400	Fund. of Eng. I*	4	23.309	Hist. of Civ. A	4		Business	4
51.531	Integ. Lang. Skills Devel. I*	2	30.402	Fund of Eng. II*	4	23.310	Hist. of Civ. B	4
			51.532	Integ. Lang. Skills Devel. II*	2	39.601	Economics I	4
						49.499	Mgt. and Org. (Int.)	4

Criminal Justice, Education, or Arts and Sciences Track: One-Year Program**Quarter 1****Quarter 2****Quarter 3**

No.	Course	Q.H.	No.	Course	Q.H.	No.	Course	Q.H.
23.309	Hist. of Civ. A	4	21.401	Prin. Soc. I	4	21.402	Prin. Soc. II	4
30.400	Fund. of Eng. I*	4	22.401	Intro. Pol. Sci. I	4	22.402	Intro. Pol. Sci. II	4
51.531	Integ. Lang. Skills Devel. I*	2	30.402	Fund. of Eng. II*	4	23.310	Hist. of Civ. B	4
			51.532	Integ. Lang. Skills Devel. II*	2		Elective	4

*Compensatory course

The Writing Center

Telephones: 437-2328 437-3086

The Writing Center offers one-to-one tutorial help in writing to all students and staff at Northeastern University. It will help students find a topic, organize and develop ideas, learn how to edit and proofread for problems in grammar, punctuation, and spelling. The Writing Center is open Monday through Friday from 9:00 a.m. to 4:00 p.m. To get help at the Writing Center, stop by room 102 Cahners to make an appointment.

Course Numbering System

The number to the left of the decimal point indicates the academic department offering the course. The three digits after the decimal point differentiate the course within the department.

Accounting	41.	History	23.
African-American Studies	25.	Industrial Engineering	05.
Allied Health Professions	86.-87.	Interdisciplinary Courses	93.
Medical Laboratory Science		International Business	
Health Record Administration		Administration	46.
Respiratory Therapy		Journalism	38.
Anthropology	20.	Management	45.
Art	27.	Marketing	43.
Biology	18.	Mathematics	10.
Business, General	49.	Mechanical Engineering	02.
Chemical Engineering	04.	Military Science	91.
Chemistry	12.	Modern Languages	
Civil Engineering	01.	French	31.
Computer Science	06.	German	33.
Cooperative Education	90.	Italian	35.
Criminal Justice	92.	Russian	34.
Drama	29.	Spanish	32.
Earth Sciences	16.	American Sign Language	36.
Economics	39.	Music	28.
Education-Counseling	53.	Nursing	80.-85.
Education-Foundations	50.	Pharmacy and Toxicology	71.-73.
Education-Curriculum		Philosophy and Religion	26.
and Instruction	51.	Physical Education	62.
Education-Speech and		Physical Therapy	64.
Hearing	55.	Physics	11.
Special Education		Political Science	22.
and Rehabilitation	56.	Psychology	19.
Electrical Engineering		Recreation and	
and Computer Engineering	03.	Leisure Studies	63.
English	30.	Sociology	21.
Finance and Insurance	44.	Speech Communication	37.
Graphic Science	09.	Transportation	48.
Health Education,			
School and Community	65.		

Classes at Northeastern University are scheduled in different modules.

In assessing quarter weights for courses, the following statement applies: *One quarter-hour of credit is equal to 50 minutes of instruction per week, plus two hours of preparation.*

The Scheduling Office (116 HA) maintains all quarter hour weights for courses. In the event of error in any publication, the academic record will reflect the correct quarter hours applicable to any degree requirement.

SPECIAL NOTE

Some course titles may change but the course number remains the same. Be sure you do not register for a course you may have already taken.

Basic College Compensatory Programs for 1983-1984

The Basic College Compensatory Education Program continues generally to encompass five courses, each bearing four quarter hours of credit, which are to be offered in the sequences indicated below. Certain freshmen may be assigned to any one of these course sequences based on tests administered during orientation week.

Fall		Winter	
10.100	Mathematical Preliminaries I	10.110	Mathematical Preliminaries II
30.101	Fundamentals of Writing I	30.102	Fundamentals of Writing II
51.146	Reading/Study Skills		

Specifically, 10.100 and 10.110 are to precede both the 10.104, 10.105, and 10.107 (non-business math) sequence and the 10.118, 10.119, and 49.249 (business math) sequence; 30.101 and 30.102 collectively replace 30.113 (standard Freshman Writing) and are to precede 30.114 (standard Introduction to Literature) and, in the case of Lincoln College, the 30.114-30.206 (Literature of Engineering) sequence.

Schedule for Continuation of Compensatory Programming in the Basic Colleges for 1983-1984

These courses are approved or disapproved for credit, except where noted, by the faculties of the individual colleges and are, therefore, subject to change.

	30.101* Writing I	30.102 Writing II	10.100* Math Prelim. I	10.110* Math Prelim. II	51.146 Read. Study Skills
Arts and Sciences	accepted	accepted	accepted	accepted	accepted
B-B Phys. Ther.	not accepted	not accepted	not accepted	not accepted	not accepted
Phys. Educ.	accepted	accepted	accepted	accepted	accepted
Rec. and Leis. Stud.	accepted	accepted	not accepted	not accepted	not accepted
Health Educ.	accepted	accepted	accepted	accepted	accepted
Bus. Admin.	accepted	accepted	accepted	accepted	not accepted
Crim. Justice	accepted	accepted	accepted†	accepted†	accepted
Education	accepted	accepted	accepted	accepted	accepted
Engineering‡	not applicable	not applicable	not applicable	not applicable	not applicable
Lincoln College	accepted	accepted	not applicable	not applicable	not accepted
Nursing B.S.	accepted	accepted	not accepted	not accepted	not accepted
Pharmacy and Allied Health Prof.	accepted§ w/o credit	accepted	not accepted	not accepted	not accepted
Computer Science	not applicable	not applicable	not applicable	not applicable	not applicable

* Graded pass/fail and therefore not included in the student's quality-point average.

† Freshmen in the College of Criminal Justice are not required to take a mathematics course in the freshman year. They can elect, however, to take 10.100 or 10.110 to prepare themselves for Fundamentals of Mathematics 10.104 as upperclassmen.

‡ Although the Colleges of Engineering and Computer Science do not allow 10.100 or 10.110 to be taken for academic credit, they do offer a special course sequence in college calculus with algebra and trigonometry (10.144 and 10.145) for engineering freshmen judged to have deficiencies in mathematics. The courses involve extra hours of work but cover the same material as the regular freshman calculus sequence in the College of Engineering.

§ Although the College of Pharmacy and Allied Health Professions does allow 30.101 to appear on the permanent record, it will only allow 30.102 for credit. Students completing the 30.101-30.102 sequence will have to make up the four-credit elective which was displaced by 30.101.

Civil Engineering

The course descriptions listed under Civil Engineering are intended to show the general scope of the subject that will be covered. Since courses are continuously updated, specific topics or methods of approach may vary from term to term.

01.101 Special Topics

4 Q.H.

(Prereq. Outstanding academic performance)

The course offers individual study in an area within the field of civil engineering, selected by the student and his/her instructor with approval by the appropriate discipline committee, resulting in a definitive report and an oral presentation.

01.102 Special Topics in Civil Engineering

(Prereq. Permission of instructor)

4 Q.H.

This is a special course within the field of civil engineering initiated by the appropriate discipline committee and approved by the department.

01.105 Civil Engineering Systems

4 Q.H.

(Prereq. 10.153)

The course covers application of system synthesis and optimization techniques for civil engineering students; Calculus method, linear programming, network analysis, and dynamic programming.

01.106 Applied Probability Theory for Civil Engineers

4 Q.H.

(Prereq. 10.153)

Topics normally include applications of probability theory to civil engineering problems, probabilities of events, random variables and distributions, derived distributions, expectation, common probability models, and an introduction to statistics.

01.110 Computer Applications to Civil Engineering

4 Q.H.

Introduction to problem solving methods in civil engineering, especially those requiring a data processing machine. Examples of civil engineering problems are introduced and methods of solution discussed. Students are assigned several projects in implementing solution techniques on computers. Proficiency in computing, problem solving, documentation, and presentation is acquired by critiquing and classroom discussion.

01.116 Engineering Measurements

4 Q.H.

(Prereq. 10.151 and 11.204)

The mathematics and instrumentation used in land surveying for obtaining measurements of distance, elevation, and direction, and the methodology applied for traverses, areas, coordinate systems, horizontal and vertical curves, earthwork, and topographic mapping.

01.117 Engineering Measurements Laboratory

2 Q.H.*

(Prereq. 09.108)

Taken simultaneously with 01.116, the course consists of field problems illustrating and applying the lecture material in 01.116, with computer application.

01.120 Fluid Mechanics

4 Q.H.

(Prereq. 01.140, 10.155)

The course gives an introduction to both the statics and dynamics of fluid mechanics. Topics include properties of fluids; pressure variation in water and air; pressure force on surfaces and submerged bodies; continuity, momentum and energy principles; dimensional analysis and hydraulic similitude; flow in closed conduits, frictional and local losses in pipes; and simple pipe problems.

01.122 Hydraulic Engineering

4 Q.H.

(Prereq. 01.120)

The course covers a variety of topics including: pipe networks; water hammer; pumps, pump selection; pipe-pump combination; flow in open channels, uniform flow formula, gradually varied flow calculations, hydraulic jump; drag forces on bodies; principles of hydrology, unit hydrograph, and rainfall-runoff relationships.

01.134 Transportation Analysis and Planning

4 Q.H.

(Prereq. Juniors and seniors only)

Course material includes establishment of planning framework; demand modeling from regional economy to transportation network assignments; mode selection; technical and economic evaluation; and current issues including environmental assessment, transportation systems management, citizen participation, and planning in developing countries.

01.135 Construction Engineering

4 Q.H.

(Prereq. Seniors only)

An overall perspective of the construction industry and tasks that must be addressed by construction management, including resource allocation, construction environment, organization, contracts, funding, cash flow, productivity, labor relations, network planning and scheduling, and project control and safety.

01.136 Highway Engineering

4 Q.H.

(Prereq. 01.116 and 01.178)

A general approach to highway engineering, topics normally include administration, economic factors, planning, environmental impacts,

*Lab fee required

geometric design, drainage, and the design of flexible pavements.

01.140 Structural Mechanics I 4 Q.H.
(Prereq. 11.204; 10.153 concurrently)

Topics normally include statics of particles and rigid bodies in two and three dimensions; analysis of internal forces in trusses and beams; centroids and centers of gravity of lines, area, and volumes; moments of inertia of areas and masses.

01.141 Structural Mechanics II 4 Q.H.
(Prereq. 01.140)

Course material includes analysis of stress and strain; mechanical properties of materials; elastic analysis of stresses and deformations of members subject to axial load, torsion, shear, and moment; introduction to column behavior.

01.142 Structural Mechanics III 4 Q.H.
(Prereq. 01.141)

Continuation of 01.141. Topics include torsion, general bending, curved members, shear flow, shear center, combined stresses including elastic and plastic behavior, continuation of column buckling, and introduction to yield and fracture criteria.

01.143 Structural Analysis I 4 Q.H.
(Prereq. 01.141)

Topics normally include review of reactions, shear and bending moment diagrams, bar forces in trusses; deflections by virtual work and moment area methods; and analysis of indeterminate structures by consistent deformations, slope deflection, and moment distribution.

01.144 Structural Analysis II
(Prereq. 01.143)

This course concentrates on matrix analysis of indeterminate structures using both flexibility and stiffness approaches; computer applications to analysis of framed structures.

01.145 Structural Analysis III
(Prereq. 01.143)

This course is a continuation of 01.143. Topics normally include slope deflection; moment distribution; effects of axial loads; symmetry; antisymmetry; nonprismatic members; influence lines for determinate and indeterminate structures, approximate methods of lateral load analysis and shear wall action.

01.147 System Dynamics 4 Q.H.
Transient response of first order exponential processes such as biological/chemical interaction, flow through porous media, heat diffusion. Dynamic behavior of second order systems with emphasis on application to structural systems. Topics will include resonance, influence of damping, impulsive and longterm loading.

01.150 Concrete Design I 4 Q.H.
(Prereq. 01.143)

Course material includes review of mechanical properties of steel and concrete; behavior and design of reinforced concrete beams for shear, moment, and bond; design of stocky columns for axial load and moment. Emphasis of course is on strength design.

01.152 Concrete Design II 4 Q.H.
(Prereq. 01.150)

Topics normally include design of slender columns, foundations, multistory buildings with one-way and two-way floor systems.

01.160 Structural Design I 4 Q.H.
(Prereq. 01.143)

The course focuses on design of steel members subject to tension, compression, bending, and combinations of loading; design of connections, braced frames, and rigid frames.

01.161 Structural Design II 4 Q.H.
(Prereq. 01.160)

Topics normally include design of steel plate girders, composite construction in bridges and buildings, plastic analysis and design, and the design of high-rise buildings subject to lateral loads.

01.174 Foundation Engineering 4 Q.H.
(Prereq. 01.178)

Topics normally include subsurface explorations, determination of soil-bearing capacity, design of shallow foundations, pile and caisson foundations, design of retaining walls, anchored bulkheads and braced sheeting, and other selected topics on foundation design and construction.

01.175 Geotechnology 4 Q.H.
(Prereq. 01.141, Juniors and seniors only)

An introduction to the geological sciences as they apply to civil engineering practice, the course focuses on the effects of significant geological features on location, design, construction, operation, and maintenance of engineering projects.

01.178 Soil Mechanics 4 Q.H.
(Prereq. 01.141 and 01.120)

Course material includes soil classification, soil-water phase relations, ground water seepage, consolidation theory, strength properties of soils, stress distributions in soils due to surface loads, slope stability.

01.179 Soil Mechanics Lab 2 Q.H.*
(Taken concurrently with 01.178)

The course focuses on laboratory exercises, including soil classification, seepage, shear strength, consolidation, and triaxial testing.

01.180 Materials 4 Q.H.
(Prereq. 12.115)

The course focuses on the structural, chemical, and mechanical properties of materials of impor-

*Lab fee required.

tance to civil engineers; fundamental nature of matter; significance of phase transformations; control of microstructure; mechanisms of failure of materials.

01.181 Materials Laboratory 4 Q.H.

A laboratory in which standard tests and equipment are used to determine structural and mechanical properties of materials common to civil engineering practice: concrete, aggregates, steel, wood, asphalt, glass, etc.

01.193 Environmental Engineering I 4 Q.H.
(Prereq. 12.115 and 01.120)

The course focuses on engineering approaches to protection and management of the environment. Topics include assessment of environmental quality; introduction to water and wastewater technology, air pollution control, and solid waste management.

01.194 Environmental Engineering II 4 Q.H.
(Prereq. 01.193)

The course concentrates on development of fundamental physical, chemical, and biological phenomena of water and wastewater systems with engineering applications in water technology from source to ultimate disposal.

01.195 Environmental and Hydraulics Lab 4 Q.H.
(Prereq. 01.120 and 01.193; 01.122 concurrently)

The course includes lectures, laboratory and field experiments in environmental and hydraulic engineering areas. Experiments in hydraulics area will cover: fluid properties, hydrostatics, drag forces, flow in pipes and channels as well as pumps and turbines. Experiments in the environmental area will include physical chemical and biological analyses normally used by environmental engineers. Field experiments will be coordinated to allow students to collect environmental and hydraulic data concurrently.

01.196 Environmental Design 4 Q.H.
(Prereq. 01.122, 01.194, 01.195)

The course consists of several individual design projects in environmental engineering affording the student an opportunity to develop a sound engineering approach to water and wastewater

management at the municipal level. Projects are given careful critique. There is one group project requiring an oral presentation.

01.197 Survey of Environmental Problems 4 Q.H.
(Prereq. Nonengineers only; permission of instructor)

A survey of problems associated with man's use of the environment, course material includes interrelation of the air-water-land complex, with emphasis on ecological stresses produced, and methodologies for assessing and controlling man's environmental impact.

01.207 Technology Assessment 4 Q.H.
(Prereq. Permission of instructor)

The course focuses on fundamental concepts of technology assessment, such as the problems of externalities, decision analysis, risk assessments, the problems of scale, and technological monocultures. The unintended impacts or the higher-order effects of technologies are stressed throughout the course.

01.210 Legal Aspects of Engineering 4 Q.H.
(Prereq. Permission of instructor)

Business law for the engineering organizations, including description and evaluation of various types of contracts for engineering services and construction, procedures for submitting bids, procedures for claims and legal steps to minimize risk exposure, both in U.S. and international business.

01.259 Air Pollution 4 Q.H.
(Prereq. Seniors only)

The course focuses on theory and practice related to engineering management of air resources; microclimate and dispersion of pollutants; atmospheric chemistry; air pollution instrumentation; control of gaseous and particulate emissions; design of air pollution control systems; biological and chemical aspects of air pollution with emphasis on the toxicological aspects of the environment; physiological effects of aerosols; analysis of organic and inorganic constituents of the atmosphere; and rationale for establishment of air quality criteria and standards.

Mechanical Engineering

The course descriptions listed under Mechanical Engineering are intended to show the general scope of the subject that will be covered. Since courses are continuously updated, specific topics or methods of approach may vary from term to term.

02.116 Dynamics 4 Q.H.
(Open to civil engineering majors)
(Prereq. 01.140)

Topics include kinematics, translating reference frames, mass moments of inertia, plane motion

of rigid bodies, and instantaneous equations of motion.

02.130 Thermodynamics I 4 Q.H.
(Prereq. 10.153)

Thermodynamics is the study of systems in which energy and its flow across systems boun-

daries are important. In this first course energy, heat, and work are defined and used in the First Law of Thermodynamics. Other thermodynamic properties and equations of state are introduced, with emphasis on tabular and graphical forms for simple compressible systems and on the ideal gas. Phases and phase transitions are briefly discussed, and energy analysis of both open and closed systems is examined. The Second Law of Thermodynamics and the property entropy are introduced, and their macro- and microscopic implications discussed. Emphasis, however, is placed on the macroscopic consequences of irreversibility and the limitation this places, through the Second Law, on the behavior of engineering systems. This course concentrates on basic concepts and their proper application to representative engineering systems.

02.131 Thermodynamics II 4 Q.H.
(Prereq. 02.130)

Course includes study of vapor cycles for use with both fossil and nuclear fuels; consideration of various gas power cycles, including the Brayton and regenerative gas turbine cycles, and the Otto and Diesel cycles for reciprocating internal combustion engines. The concept of availability is introduced, integrated with the study of the above cycles, and followed by the thermodynamics of nonreacting mixtures, particularly for air-water vapor mixtures.

02.132 Introduction to Combustion 4 Q.H.
(Prereq. 02.131 and 12.115)

An introduction to the science and technology of combustion. The fundamental principles of thermochemistry, chemical equilibrium, and rates of reaction are reviewed and related to combustion processes in heat engines. The principles of combustion waves are introduced, and the mechanisms of various physical and chemical processes in combustion are discussed.

02.134 Direct Energy Conversion 4 Q.H.
(Prereq. 02.131 and 12.115)

This course is concerned with means for converting heat directly into electrical energy. The operating principles of such devices, principally magnetohydrodynamic power generators and fuel cells, are discussed. Other topics, such as energy storage, thermionic converters, and irreversible thermodynamics as a basis for a unified theory of energy conversion may be included.

02.140 Computer Aided Design 4 Q.H.
(Prereq. 09.108 and 02.168)

The concepts of computational and numerical geometry for design are introduced. The implementation of computer graphics in design and use of computer-aided design packages are included. Principles of numerical control techniques to design and manufacture are covered. A design project is required.

02.145 Design Fundamentals 4 Q.H.
(Prereq. 02.168)

The course focuses on engineering design analysis of dynamically loaded machine elements. Topics include stress concentration; contact and impact stresses; thorough treatment of fatigue factors in design (combined loading and statistical considerations); and environmental factors in design, creep, temperature, and atmosphere.

02.146 Mechanical Engineering Design 4 Q.H.
(Prereq. 02.145)

The course offers project(s), using system approach, that involve all aspects of mechanical engineering. This course is intended to provide students an opportunity to correlate previous courses in design of mechanical systems.

02.147 Engineering Design 4 Q.H.
(Prereq. 02.168)

This course is intended for students who take only one course in design. Design projects vary from year to year, but in general expand and correlate previous courses in design of mechanical systems.

02.148 Design and Analysis 4 Q.H.
(Prereq. 02.146; cannot be taken simultaneously with 02.193 or 02.194)

A project must be of a design nature and must be approved by the faculty member under whom the student will work. A formal report must be submitted to the student's faculty supervisor at the end of the quarter.

02.149 Engineering Analysis 4 Q.H.
(Prereq. 02.168)

The course focuses on the numerical and experimental methods in stress analysis. Analytical techniques include an introduction to the finite element method. Experimental methods include, among others, strain gauge techniques and photoelasticity.

02.150 Heat Transfer I 4 Q.H.
(Prereq. 02.130, 02.155, and 10.156)

The theories that describe conduction, convection, and thermal radiation heat transfer mechanisms are studied. Steady-state and transient conduction problems are discussed in rectangular, cylindrical, and spherical coordinate systems. Electrical analogy and numerical methods are also considered. Convective heat transfer mechanisms are studied, and the concept of the Nusselt-Reynolds Number correlation is introduced. Description of thermal radiation heat transfer between surfaces is discussed.

02.155 Fluid Mechanics I 4 Q.H.
(Prereq. 02.130, 02.167, and 10.155)

The course offers an introduction to the concepts of fluid mechanics: fluid statics, including pressure distribution and forces on submerged surfaces; differential and integral formulations of conservation of mass, momentum, and energy

with emphasis on control-volume applications; pipe flow with consideration of head loss, use of the Moody diagram, and analysis of pipe networks.

02.156 Fluid Mechanics II 4 Q.H.
(Prereq. 02.155)

Topics include velocity potential and stream functions; circulation and Kelvin's theorem; two-dimensional, steady irrotational incompressible flow; Karman-Pohlhausen method applied to two-dimensional boundary layers.

02.157 Fluid Machinery 4 Q.H.
(Prereq. 02.155)

The course focuses on the general principles of turbomachinery: definitions of efficiency and a discussion of the requirements for similitude; machine selection to suit particular applications. Both liquid- and gas-handling machines are examined, and performance limits imposed by cavitation and choking are considered.

02.163 Mechanics 4 Q.H.
(Prereq. Electrical engineering majors only)

The course focuses on the study of kinematics and kinetics of rigid bodies, instantaneous equations of motion, work and energy, and impulse and momentum.

02.165 Mechanics I 4 Q.H.

Topics include the concept of vector representation of force and moment; equivalent force systems; centroids and centers of gravity, distributed forces; equations of equilibrium; free body diagrams; applications to trusses, pin-connected frames and beams; and elementary concepts in friction.

02.166 Mechanics III 4 Q.H.
(Prereq. 02.165)

Development of problem-solving ability in the fundamentals of dynamics. Topics include kinematics of particles, kinematics of rigid bodies (nonrotating frames), mass moments of inertia, kinetics of particles and rigid bodies (plane motion only) using force, mass, and acceleration.

02.167 Mechanics II 4 Q.H.
(Prereq. 02.165)

Topics include concept of stress and strain; principal stresses; Mohr's circle, stress-strain diagrams; moment of inertia of areas; stress and deformation of simple members under axial and torsional loads, and stresses in symmetrical beam bending.

02.168 Mechanics IV 4 Q.H.
(Prereq. 02.167)

Topics include asymmetrical bending; analysis of determinate and indeterminate beams by various methods; and buckling of columns.

02.169 Intermediate Strength of Materials 4 Q.H.
(Prereq. 02.168)

Topics include analysis of curved beams, rings, and thick-walled pressure vessels; introduction to plane elasticity problems using rectangular and polar coordinate systems.

02.171 Mechanical Vibrations 4 Q.H.
(Prereq. 02.166)

The course focuses on the study of one-, two-, and multi-degrees of freedom systems using classical, energy, Laplace, mobility, matrix, and computer techniques. A laboratory is included in this course.

02.172 System Analysis and Control 4 Q.H.
(Prereq. 02.166)

This course provides students the opportunity to gain a theoretical background for analyzing and designing a linear control system. System modeling, linear approximations and their limitations, transfer functions, and block diagramming; applications of the Laplace transform; transient and frequency response; and stability, frequency domain, and root locus techniques are discussed.

02.174 Design for Space Applications 4 Q.H.
(Prereq. 02.166)

The course includes an exploration of Keplerian motion and transfer dynamics using Battin's solution. Optimization of transfer dynamics with respect to our solar system, and mass optimization, boost, and reentry dynamics are studied. System design is used throughout the course.

02.176 Dynamics

(Prereq. 02.166)

Continued development of problem-solving ability in dynamics. Topics include kinematics of rigid bodies using rotating frames, kinetics of particles and rigid bodies using work and energy, introduction of Lagrange's equations, kinetics of particles and rigid bodies using impulse and momentum, and simple gyroscopic motion.

02.192 Measurements and Analysis 4 Q.H.*
(Prereq. 02.130 and 02.167)

Lecture subjects include design of experiments, instrumentation, measurements, data analysis, and report writing. Students apply the principles developed in class to a variety of laboratory experiments. Written reports are required.

02.193 Mechanical Engineering Project I 4 Q.H.*
(Prereq. 01.192; cannot be taken simultaneously with 02.148 or 02.194)

The project may be of an analytical or experimental nature. It must be approved by the faculty member under whom the student will work, and a formal report must be submitted to the student's faculty supervisor at the end of the quarter.

*Lab fee required.

02.194 Mechanical Engineering Project II 4 Q.H.
(Prereq. 02.192 cannot be taken simultaneously with 02.148 or 02.193)

If a project initiated under course 02.193 is large enough in scope, a second project course may be taken with the approval of the faculty supervisor. A formal report must be submitted to the student's faculty supervisor at the end of the quarter.

02.196 Materials Science 4 Q.H.
(Prereq. 02.130 and 12.115)

An introduction to materials science for engineers, emphasizing the structure-property-function relation. Topics include crystallography, structure of solids, imperfections in crystals, phase equilibrium, phase transformations, diffusion, and physical properties. A laboratory is included in this course.

02.197 Mechanical Behavior of Materials 4 Q.H.
(Prereq. 02.196 and 02.167)

The study of the physical basis for the mechanical behavior of solid materials, including elasticity, plasticity, viscoelasticity, and fracture. Application is made to structural alloys and polymers.

02.198 Materials Processing 4 Q.H.
(Prereq. 02.196)

The course offers a survey of the essential features and materials limitation of various methods for processing materials. Topics include heat treatment (ferrous and nonferrous alloys), casting, forming, joining, and machining.

02.199 Materials Science 4 Q.H.
(Prereq. 02.130 and 12.115)

An introduction to materials science for engineers, emphasizing the structure-property-function relation. Topics include crystallography, structure of solids, imperfections in crystals, phase equilibrium, electrical behavior of metals and semiconductors.

02.232 Engineering Materials 4 Q.H.
(Prereq. 02.196)

This course is concerned with the utilization of materials science in the application and selection of materials. Topics include reactions with environment, i.e., oxidation and corrosion; materials selection criteria; and materials engineering case studies dealing with materials selection and failure analysis.

02.233 Thermodynamics of Propulsion 4 Q.H.
(Prereq. 02.131 and 12.115)

The course focuses on application of the principles of thermodynamics and fluid mechanics to understanding the behavior of propulsion devices. Emphasis is on air-breathing engines such as the aircraft gas turbine and the ramjet. Various engine components, such as inlets, diffusers, compressors, combustors, turbines, and nozzles are discussed.

02.236 Nuclear Engineering I 4 Q.H.*
(Prereq. 02.131)

The course offers a study of nuclear physics emphasizing atomic and nuclear structure, radioactive decay, and nuclear reactions, with particular attention to fusion and fission. The course also examines health physics, nuclear instrumentation, and the production and uses of radioactive isotopes. A general comparison of thermal, fast, and broader reactor types is made prior to a discussion of neutron interactions and their slowing down. The four-factor formula and diffusion equation are developed and applied to one-group theory for bare and reflected thermal reactors. Flux shaping as well as energy production and distribution within the core are discussed.

02.237 Nuclear Engineering II 4 Q.H.
(Prereq. 02.236)

The course focuses on development of two-group theory for thermal reactors and consideration of the physics and safety of fast reactors. Effect of reactivity change, either intentional or accidental, as well as changes due to temperature, fission product build-up, xenon build-up after shutdown, and fuel depletion are discussed. Reactor design considerations involving the interrelation of reactor physics, reactor engineering control, distribution of power, and fuel cycle management are considered.

02.240 Internal Combustion Engines 4 Q.H.
(Prereq. 02.131)

The concepts and theory of operation of internal combustion engines are presented based upon the fundamental engineering sciences of thermodynamics, gas dynamics, heat transfer, and mechanics. The design and operating characteristics of conventional spark-ignition, compression-ignition, Wankel, and stratified charge spark-ignition engines are discussed. Performance analysis using Newhall-Starkman charts and computer programs are included.

02.258 Gas Dynamics 4 Q.H.
(Prereq. 02.155)

Course focuses on application of the principles of fluid mechanics to compressible flows. Wave propagation and the concepts of sound speed and Mach number are discussed. The emphasis is on one-dimensional steady flows with an examination of the effects of area change, friction, and heat transfer, including a consideration of normal shock waves and the possibility of choking.

02.260 Heat and Mass Transfer 4 Q.H.
(Prereq. 02.150)

Heat exchange design is explored by both the logarithmic mean temperature difference (LMTD)

*Lab fee required.

and the effectiveness-NTU (number of transfer units) methods. The radiant heat transfer, the nature of solar radiation, and the design of a flat-plate solar collector are discussed.

02.290 Special Topics

4 Q.H.

(Permission of the department)

Topics covered will vary from term to term depending on the interests of the students and the department.

Electrical Engineering

The course descriptions listed under Electrical Engineering are intended to show the general scope of the subject that will be covered. Since courses are continuously updated, specific topics or methods of approach may vary from term to term.

03.101 Discrete Systems

4 Q.H.

(Prereq. 09.108)

Topics include historical review and future perspectives of discrete systems; representation of digital signals, quantization; introduction to digital filters, moving average filters; Z-transforms, inverse Z-transforms; recursive digital filters, stability considerations, steady-state and transient response; introduction to non-recursive techniques, the discrete Fourier transform, the fast Fourier transform; applications to computation of systems transfer functions.

03.111 Circuits and Systems I

4 Q.H.

(Prereq. 10.152 and 11.205)

The course covers circuit elements (linear, non-linear, time-invariant, and time-varying), sources (independent and controlled), Kirchhoff's laws, Tellegen's theorem, Thevenin's theorem, network topology, mesh and nodal analysis.

03.112 Circuits and Systems II

4 Q.H.

(Prereq. 03.111)

Topics include linearity and time-invariance, system function, forced and force-free response of networks and LTI systems, singularity response, partial fraction expansion, "pre-box" concept, and convolution.

03.113 Circuits and Systems III

4 Q.H.

(Prereq. 03.112)

Topics include Thevenin's theorem revisited, magnitude and phase plots, resonance, two-port networks, energy and power, and convolution.

03.119 Circuits and Systems A

6 Q.H.

(Prereq. 10.152 and 11.205)

Includes the material covered in course 03.111, Circuits and Systems I, plus half of the material in course 03.112, Circuits and Systems II.

03.120 Circuits and Systems B

6 Q.H.

(Prereq. 03.119)

Completes the material in 03.112, Circuits and Systems II, plus the material in course 03.113, Circuits and Systems III.

03.122 Circuits and Systems IV

4 Q.H.

(Prereq. 03.113)

The course focuses on basic concepts and techniques of linear system theory. Review of system theory in terms of the convolution integral; waveform representation in terms of the Fourier series, Fourier Integral, and the bilateral Laplace transform; system concepts in terms of the function and their application to filters and feedback systems.

03.131 E.E. Laboratory I-Measurements

2 Q.H.*

(Prereq. 03.111)

The course covers basic electrical measurements; report writing, use of standard laboratory instruments, including digital voltmeters, oscilloscopes, and bridges.

03.132 E.E. Laboratory II-Circuits and Systems

2 Q.H.*

(Prereq. 03.112)

The course includes experiments relevant to the Circuits and Systems courses, together with more work in measurements.

03.133 E.E. Laboratory III-Devices

2 Q.H.*

(Prereq. 03.141)

The course includes introduction to the digital computer, electro-optics, terminal characteristics of active devices.

03.134 E.E. Laboratory IV

2 Q.H.*

(Prereq. 03.142 and 03.161)

The course includes logic circuits, design and testing of active circuits, microwave studies, control systems, digital computation.

03.146 Electronics A

4 Q.H.

(Prereq. 03.113; not open to students who have taken 03.141, 03.142, and 03.144)

This first course in electronics stresses the use of transistors in digital integrated circuits. Topics include fabrication and processing of integrated circuits, characteristics of the theoretical physical junction, Ebers-Moll model for bipolar junction transistors, characteristics of bipolar and field-effect devices, basic digital

inverters and logic gates, and various logic families (CMOS, TTL, MOS, and I²L).

03.147 Electronics B 4 Q.H.

(Prereq. 03.146 and 03.122; not open to students who have taken 03.141, 03.142, and 03.144)

This second course in electronics stresses the use of transistors in the design of analog circuits. Much of the emphasis is on integrated circuit devices. Topics covered include biasing, linearized incremental models involving controlled sources, load line techniques, early effect, use of signal flowgraphs for solving circuits, frequency response and gain calculations for single stage and cascaded stages, and differential and operational amplifiers.

03.148 Electronics C 4 Q.H.

(Prereq. 03.147; not open to students who have taken 03.141, 03.142, and 03.144)

This third course in electronics continues the development of analog electronic circuits. Topics include concept of feedback, open- and closed-loop gain, effect of feedback on impedance levels and frequency response, limitations on the performance of operational amplifiers, stability and compensation in feedback systems, analog circuit applications, and an Analog/Digital system design example.

03.151 E.E. Laboratory I-A 1 Q.H.*

(Prereq. 11.205)

The course focuses on basic electrical measurements; report writing; and use of laboratory instruments, including digital voltmeters, oscilloscopes, and bridges.

03.152 E.E. Laboratory I-B 1 Q.H.*

(Prereq. 03.151)

A continuation of 03.151, E.E. Laboratory I-A.

03.153 E.E. Laboratory II-A 1 Q.H.*

(Prereq. 03.152)

Experiments in conjunction with courses 03.111 and 03.112, Circuits and Systems I and II. Additional experiments in measurements.

03.154 E.E. Laboratory II-B 1 Q.H.*

(Prereq. 03.153)

Continuation of 03.153 in conjunction with courses 03.113 and 03.122, Circuits and Systems III and IV.

03.155 E.E. Laboratory III-A 1 Q.H.*

(Prereq. 03.154)

Introduction to the digital computer and logic circuits, as well as experiments tied in with 03.146 and 03.147, Electronics A and B.

03.156 E.E. Laboratory III-B 1 Q.H.

(Prereq. 03.155)

Continuation of 03.155 with some experiments relevant to 03.161 and 03.162, Field Theory I and II.

03.161 Electromagnetic Field Theory I 4 Q.H.

(Prereq. 10.155)

The course focuses on definition and representation of scalar and vector fields. Coordinate systems; elements of vector calculus; definition of the concepts of gradient, divergence, curl, and the "del" operator; free-space electrostatics; definition of the electric field intensity; the scalar potential; solution to Poisson and Laplace equations; macroscopic model of dielectric materials; the electric polarization and the electric flux density vector; boundary conditions; Lorentz force; free space magnetostatics; magnetic vector potential and solution to the "vector" Poisson equation; macroscopic model of magnetic materials; magnetization and magnetic field intensity; boundary conditions.

03.162 Electromagnetic Field Theory II 4 Q.H.

(Prereq. 03.161)

Topics include generalization of the Maxwell equations to the case of time-varying fields; Faraday induction law; wave equations and the plane wave solution; Poynting theorem and the concept of energy stored by the fields; reflection and refraction of plane waves; time-harmonic wave equations for the scalar and vector potentials; time-harmonic form of retarded potentials; radiation from dipole; motion of charged particles in fields; magnetoionic media; elementary discussion of plasma physics and M.H.D.

03.175 Electromechanical Dynamics 4 Q.H.

(Prereq. 03.113, and 03.161)

The course offers review of the Maxwell equations and quasistatic approximations, electric and magnetic energy concepts, state-variable formulation of electromechanical coupling. Applications to elementary energy conversion devices, singly and doubly excited magnetic devices with mechanical, translational, and rotational elements. Generalized rotating electromagnetic energy converters; circuit-model concepts; applications to selected extant rotating machines, i.e., commutator machines and a-c machines; dynamic response to various stimuli are studied.

03.176 Machines and Systems 4 Q.H.

(Prereq. 03.177)

The course offers a detailed investigation of the operating principles of synchronous machines, synchronous motor and generator power-angle characteristics, machine dynamics, machine and power system stability.

03.177 Introduction to Electric Machinery 4 Q.H.

(Prereq. 03.161)

Topics include review of magnetic field, energy, and energy conversion concepts. Transformers and their circuit representations; application of

*Lab fee required

energy conversion concepts to basic rotating machines and exploration of the Theory of Induction, synchronous, and d-c machines. Limitations in actual machines will be discussed.

03.178 Transients in Electric Power

Systems

4 Q.H.

Introduction to the response of various elements of a power network to the transients caused by lightning, switching, and faults. Some of the equipment to be considered in terms of transient response include the transmission line, lightning arresters, fuses, transformers, and circuit breakers.

03.183 Electrical Engineering I

4 Q.H.

(Prereq. 10.152; not open to electrical engineering majors)

Introductory course to electric circuit theory covers Kirchhoff's laws, loop and nodal analysis, Thevenin's theorem, power and energy, exponential excitation and the system function.

03.184 Electrical Engineering II

4 Q.H.

(Prereq. 03.183; not open to electrical engineering majors)

Properties and analysis of electronic devices, circuits, and systems; elements of control systems; principles of energy conversion. Emphasis on each topic determined according to major discipline.

03.185 Power Systems and Controls

4 Q.H.

(Prereq. 03.183)

Basic concepts of electromechanical energy conversion stressing the terminal characteristics and operation of d-c and a-c machines, elements of power distribution systems, and concepts of feedback control, with application to power systems and plant control.

03.186 Basic Electrical Instrumentation

4 Q.H.*

(Prereq. 03.183)

Basic electrical measurement devices, including ammeters, voltmeters, oscilloscopes, and bridges; instrumentation techniques such as direct measurement, comparative measurement, and analog methods. Application to non-electrical disciplines is included.

03.187 Modelling Techniques

4 Q.H.

(Prereq. 03.183 and 03.184; also FORTRAN IV programming)

Introduction to the concept of modelling techniques to represent physical, biological, and social systems; electrical analogs and use of analog computers; introduction to digital modelling and the use of digital computation.

03.191 Introduction to Digital Computers I:

Design and Organization

4 Q.H.

(Prereq. 11.205 and 10.153)

Introduction to the basic components of digital systems and methods for their analysis and design: logic gates and flipflops, Boolean algebra, and combinational and sequential circuits. Inte-

grated circuit logic families and functional building blocks: registers, counters, decoders, multiplexers, and memories. Data representation and coding techniques. Register-transfer language for specification of instruction sets, processor organization, and logic design. Case study of a specific central processor instruction set implementation. Assembly language programming techniques and introduction to system software.

03.192 Introduction to Digital Computers II: Fundamentals of Computation Structures

(Prereq. 03.191)

4 Q.H.

Central processor alternatives: instruction formats, addressing modes, bus structures, arithmetic units, timing analysis, and stacks. Algorithms for arithmetic operations with various data representations. Input-output and memory organization. Introduction to microprocessors. This course, like its predecessor 03.191, is oriented toward the design, not just the comprehension, of digital systems likely to be encountered by the electrical engineer.

03.200 Special Topics

4 Q.H.

(Prereq. Permission of Department)

Topics covered vary from term to term depending on the interests of the Department and the students.

03.204 Microcomputer-Based Design

4 Q.H.

(Prereq. 03.192)

Course material includes characteristics of microprocessor applications; external and internal architecture of a specific microprocessor family; logic design of a simple microcomputer. Instruction set, timing cycles, I/O port selection and interrupt-handling; software design for keyboard monitor, breakpoint facility and multiplexed displays. Application design studies of real-time interfaces to electromechanical devices. Evolutionary trends in LSI microprocessors and memory systems. Integrated hardware and software design projects using laboratory microcomputers are an integral part of this course, which is designed primarily for electrical engineers.

03.218 Control System Theory

4 Q.H.

(Prereq. 03.144)

Control system concepts; goals and basic components. Review of time- and frequency-domain techniques. Classical control system theory; error analysis for different systems. Analysis of second- and third-order systems. Stability and relative stability using root locus and Nyquist diagrams. The Nichols chart. Compensation, application of computer technology to control systems analysis and design. State-variable description of dynamic systems. The state equations and the fundamental analog realization of the standard equations. Properties of the state-transition matrix. Optimal systems. Introduction to

*Lab fee required.

sampled data systems. The Z-transform as an analog to the Laplace transform.

03.221 Electrical Power Systems I 4 Q.H.
(Prereq. 03.113)

This course, together with 03.222, Electrical Power Systems II, is designed to give a broad view of the structure of those electric systems having the primary function of energy transfer and especially those that function to transfer large quantities of energy. The functions of the various system elements are described and their significant characteristics are investigated briefly. The interrelation between elements is treated.

03.222 Electrical Power Systems II 4 Q.H.
(Prereq. 03.221)

A continuation of Electrical Power Systems I. Problems such as voltage control, protection, economics, and planning that relate to the system as a whole. Taken with the previous course, it may provide a general background for more intensive studies of electric power systems.

NOTE: A student may take either both electives in sequence or the first course only.

03.233 E.E. Power Laboratory I 2 Q.H.*

The course covers experimental work with polyphase power equipment, power measurements, polyphase power rectification, steady-state and dynamic operation modes of polyphase induction motors, power transformers and symmetrical component analysis of unbalanced loading of transformers, analog computer.

03.234 E.E. Power Laboratory II 2 Q.H.*
(Prereq. 03.246)

The course covers experimental work with rotating machinery and systems; steady-state and dynamic modes of operation of the commutator and synchronous machines; system study involving synchronous machines; selected experiments in control systems; network analyzer studies.

03.237 Senior Project Laboratory I 2 Q.H.*
(Prereq. 03.142 and 03.162)

In this course students work with a faculty adviser on some term project, either experimental or theoretical.

03.238 Senior Project Laboratory II 2 Q.H.*
(Prereq. 03.142 and 03.162)

This course may be a continuation of the project started in 03.237 or it may be a new project. Again, the student works closely with a faculty adviser.

03.241 Selected Topics in Electronics 4 Q.H.
(Prereq. 03.147)

This course concerns (1) the description and application of those electronic devices (thyristors, photodiodes, etc.) not covered in depth in the regular electronics sequence, (2) electronic subsystems (AFC, shift registers, etc.); (3) systems (navigation systems, telephone switch-

ing systems, etc.). Most of the presentations are made by students on topics of their choice, but there are also lectures by invited speakers as well as by the instructor.

03.242 Theory and Technology of Semiconductor Devices I 4 Q.H.*
(Prereq. 02.196)

This course comprises a closely coupled lecture and laboratory series. Topics covered include technology and physics of the planar diffusion process, electronic properties of homogeneous semiconductors, inhomogeneities and junctions (Fermi potential diagrams, equilibrium at an abrupt discontinuity, and the behavior of a junction under applied bias), and the junction transistor.

03.243 Theory and Technology of Semiconductor Devices II 4 Q.H.*
(Prereq. 03.242)

This course is a continuation of 03.242. Material covered includes introduction to unipolar transistor action, introduction to surface effects, the MOS-FET, and a discussion of noise problems encountered in semiconductor devices.

03.245 E.E. Power Laboratory A 1 Q.H.*

03.246 E.E. Power Laboratory B 1 Q.H.*

03.251 Communication Theory 4 Q.H.
(Prereq. 03.122)

Topics include signal analysis, including signal classes, Fourier methods, correlation functions, amplitude density, and power spectra; amplitude modulation, Hilbert transform applications, analytic signal, and complex envelope.

03.252 Fundamentals of Communication Systems 4 Q.H.
(Prereq. 03.251)

Topics include frequency modulation, signal-to-noise ratios in AM and FM, multiplexing, sampling theory, pulse modulation systems, data transmission, signal space. Correlation detection, probability, random variables and random processes, information theory and coding.

03.261 Wave Transmission and Reception 4 Q.H.
(Prereq. 09.108 and 03.161)

Topics include analysis of radiation, transmission, and reception of electromagnetic and acoustic waves using graphical and digital computer techniques. Design of distributed systems, antennas, microphones, loudspeakers, and sonar transducers.

03.262 Advanced Topics in Electromagnetic Field Theory 4 Q.H.
(Prereq. 03.162)

This course is a continuation of the required courses in field theory. Topics covered include microwave and waveguide structures, careful development of electromagnetic energy and force concepts, and an introduction to radiation and antenna theory.

03.281 Machine Language and Assembly Language Programming 4 Q.H.
(Prereq. 03.191)

This course focuses on study of the machine and assembly languages of a selected digital computer. Machine representation of numbers, characters, and instructions. Machine language programming; flow of control, relocatability, input/output instructions, addressing, and instruction modification. Symbolic assembly language; macros, literals, and pseudo-instructions. Several programming projects are an integral part of the course.

03.282 Programming Systems 4 Q.H.
(Prereq. 03.281)

Continuation of 03.281. Assemblers, searching and sorting techniques, macro-processors, loaders. High-level languages and an introduction to their compilation. Introduction to operating systems. Programming projects are an integral part of the course.

03.285 Applied Discrete Analysis 4 Q.H.
(Prereq. 10.155)

The course offers an introduction to elementary number theory, modern algebra, combinatorial mathematics and discrete probability theory, including such topics as prime numbers, least common multiple, greatest common divisor, Euclid's algorithm, continued fractions, congruences, groups, rings, fields, Boolean algebra, combinations and permutations, generating functions, random variables, and Markov chains. The material in this course is widely applicable to the field of computer science.

03.292 Mathematical Techniques in Electrical Engineering I 4 Q.H.
(Prereq. 10.155)

The goals of this course are: (1) to introduce the basic precepts of the Theory of Complex Variables; (2) to organize and codify the student's understanding of analysis (i.e., the properties of analytic functions); (3) to augment the student's sensitivity to questions of rigor and the limitations on the applicability of fundamental techniques; (4) to provide an appreciation of nine-

teenth-century mathematics and those who contributed to it; (5) to suggest applications of the subject matter without being an applications course per se.

Topics, depending on time and student background, include complex numbers and functions of a complex variable; infinite series, uniform continuity, and convergence; Cauchy theorems and formulas; the calculus of residues; conformal representation, integral functions; and special functions.

03.293 Mathematical Techniques in Electrical Engineering II 4 Q.H.
(Prereq. 10.155 or equiv.)

Topics include matrix notation and development of matrix algebra. The solubility of sets of linear equations; determinants, linear transformations, invariance, quadratic forms and eigenvalues. Illustrative applications of matrix techniques for the formulation and solution of problems are drawn from the realm of circuit theory, probability theory, and engineering physics.

03.295 Numerical Methods and Computer Applications 4 Q.H.
(Prereq. 09.108 and 03.122)

The course focuses on presentation of numerical techniques used in solving scientific and engineering problems with the aid of digital computers. Topics covered include modeling and simulating of deterministic and probabilistic systems, theory of interpolation, iteration methods, numerical solution of ordinary and partial differential equations, signal detection, and use libraries of scientific subroutines. Representative problems are chosen for solution on a digital computer.

03.296 Digital Techniques 4 Q.H.
(Prereq. 03.146 and 03.191)

This course attempts to supplement the topics covered in the electronics sequences and the introduction to digital computer courses. Topics may vary from year to year and may include details of semiconductor integrated gate circuits, flip flops, clocks, counters, memory units, A/D and D/A conversions, coding, and the fundamental techniques of digital data transmissions.

Chemical Engineering

The course descriptions listed under Chemical Engineering are intended to show the general scope of the subject that will be covered. Since courses are continuously updated, specific topics or methods of approach may vary from term to term. In addition to meeting course prerequisites, students are expected to take each chemical engineering course in the sequence shown on the specimen program sheet.

04.101 Chemical Engineering Calculations I 4 Q.H.*
(Prereq. 12.115)

This course examines application of fundamental laws of mass and energy conservation to

chemical and physical processes. In this course the primary emphasis is on material balances. A computational laboratory is included to aid students in improving facility in handling problems typical of the course.

*Lab fee required.

04.102 Chemical Engineering Calculations II(Prereq. 04.101) **4 Q.H.**

Emphasis in this course is on energy balances and the simultaneous application of mass and energy conservation laws. Problems selected from those typical of the chemical processing industries are considered.

04.106 Polymer Science and Engineering(Prereq. 12.147) **4 Q.H.**

This course provides instruction in the nature of polymeric materials and their importance to the chemical industries and everyday life. Topics include polymer classification, composition, structure, physical properties, chemical properties, and methods of polymer synthesis.

04.111 Chemical Engineering I(Prereq. 04.102) **4 Q.H.**

The important unit operations of chemical engineering: fluid mechanics, heat transfer, and evaporation are examined.

04.112 Chemical Engineering II(Prereq. 04.111) **4 Q.H.**

This course is a continuation of 04.111 to mass transfer unit operations: distillation and gas absorption.

04.121 Transport Phenomena I(Prereq. 04.111) **4 Q.H.**

The mechanisms of momentum transport in fluid-flow phenomena are described. Velocity distributions for Newtonian fluids in the laminar and turbulent flow regimes are derived and utilized in the analysis of elementary fluid-flow problems.

04.122 Transport Phenomena II(Prereq. 04.121 and 04.112) **4 Q.H.**

Mass and heat transport by the mechanisms of molecular and bulk motion are described. A variety of elementary physical and chemical transport problems are analyzed in terms of these mechanisms.

04.123 Experimental Methods I(Prereq. 04.112) **4 Q.H.***

Experimental approach to solving chemical engineering problems and preparing reports to detail the results and their interpretations. Experiments illustrating the fundamental unit operations are performed.

04.124 Experimental Methods II(Prereq. 04.123) **4 Q.H.***

A continuation of 04.123, requiring more advanced experimentation and more sophisticated reports.

04.126 Chemical Engineering Thermodynamics(Prereq. 04.102) **4 Q.H.**

Topics include the first law and its application to batch and flow systems, heat effects in chemical and physical processes, thermodynamic properties; the second law, entropy, physical and

chemical equilibria; emphasis on the fundamental principles and mathematical relations and their application to the analysis and solution of a variety of engineering problems.

04.131 Process Design I(Prereq. 04.122 and 04.126) **6 Q.H.***

Process design of a chemical plant. Topics include process selection, material and energy balances, equipment selection and/or design, elements of instrumentation, flowsheets, and cost estimates.

04.132 Process Design II(Prereq. 04.131) **6 Q.H.***

This course is a continuation of 04.131. A more complex design is required. Additional elements of process design are studied.

04.133 Projects I(Prereq. Senior standing and consent of Dept.) **6 Q.H.***

This course offers individual research related to some phase of chemical engineering. Open only to students selected by the Department head on the basis of scholarship and proven ability.

04.134 Projects II(Prereq. 04.133) **6 Q.H.***

The course offers a continuation of the research work undertaken in 04.133.

04.135 Principles of Nuclear Engineering(Prereq. Senior standing) **4 Q.H.**

The course offers an introduction to the principles of nuclear engineering. Elements of nuclear physics, reactor physics, and radiation safety are presented together with engineering techniques specific to the nuclear industry.

04.136 Chemical Engineering Kinetics(Prereq. 04.126) **4 Q.H.**

Topics include fundamental theories of the rate of chemical change in homogeneous reacting systems; integral and differential analysis of kinetic data; design of batch and continuous-flow chemical reactors; introduction to heterogeneous reactions and reactor design.

04.137 Mathematical Methods in Chemical Engineering(Prereq. Senior standing) **4 Q.H.**

The course examines formulation and solution of problems taken from chemical and engineering studies that require advanced mathematical methods. Emphasis is placed primarily on the formulation step, although numeric and analytic solution techniques for solving sets of algebraic equations and for solving ordinary and partial differential equations are discussed.

04.138 Chemical Process Control(Prereq. Senior standing) **4 Q.H.**

The course focuses on principles of automatic control with applications to chemical processing systems. Topics such as process modeling and control system design are included.

*Lab fee required.

- 04.142 Introduction to Optimization** 4 Q.H.
(Prereq. Senior standing)
Elementary optimization techniques, such as gradient methods, pattern search, linear programming, and dynamic programming, are described and applied to a variety of elementary physical and chemical problems.
- 04.143 Special Topics** 4 Q.H.
(Prereq. Senior standing)
Chemical engineering topics of interest to the staff member conducting the class are presented for study.
- 04.144 Chemical Energy Economics** 4 Q.H.
(Prereq. Senior standing)
Financial decision-making techniques are introduced and applied to the problems of production, transportation, and utilization of chemical energy resources such as petroleum, natural gas, coal, and shale oil.
- 04.145 Mass Transfer Operations** 4 Q.H.
(Prereq. Senior standing)
Course focuses on calculation and design methods used in processes involving mass transfer. Topics covered include vapor-liquid equilibria for binary and multicomponent systems, multicomponent distillation, absorption, and extraction.
- 04.147 Analysis of Chemical Processes** 4 Q.H.
(Prereq. 04.126, 04.136, and senior standing)
Course focuses on methods and reactions used for making chemical products on a large scale. Topics covered include types of physical and chemical equilibria, flow-sheet patterns, energy management, and catalytic and noncatalytic rate problems. A number of situations involving simultaneous application of the above topics in process analyses are studied.
- 04.148 Management in the Chemical Industries** 4 Q.H.
(Prereq. Senior standing in engineering)
The course focuses on principles of management as applied to the chemical process in-

dustries. Case studies are used to supplement lectures and discussion.

- 04.149 Kinetics of Polymerization Process** 4 Q.H.
(Prereq. 04.136, 12.148, and senior standing)
The course focuses on the mechanisms by which polymeric materials are assembled via chemical reaction. Reaction-rate models based on these mechanisms are utilized to investigate the effect of reaction parameters on the chemical and physical structure of the polymeric product. The specific polymerization processes considered are free radical addition, condensation, and ionic.
- 04.152 Pollution Control in Chemical Industries** 4 Q.H.
(Prereq. Senior standing)
Students are instructed in fundamental operations for handling environmental problems in the chemical process industries. Water quality requirements and industrial waste characteristics are discussed.
- 04.154 Chemical Process Development** 4 Q.H.
(Prereq. Senior standing)
The course offers a study of the manner in which a chemical process evolves from the research laboratory to full-scale production. Typical processes are used as illustrations. Topics covered include economic factors, safety factors, batch vs. continuous operation, process evaluation, developing the flow sheet, and scale-up considerations.
- 04.155 Corrosion Engineering** 4 Q.H.
(Prereq. Senior standing)
The course covers the fundamentals of corrosion engineering: theories of corrosion, corrosion testing, corrosion protection, and selected relevant topics.
- 04.481 Nuclear Technology** 4 Q.H.
(Prereq. 10.422, 11.319 BET only)
Topics include atomic and nuclear structure, nature of radioactivity, radiological safety, use of nuclear instrumentation, and elements of nuclear reactors.

Industrial Engineering

The course descriptions listed under Industrial Engineering are intended to show the general scope of the subject that will be covered. Since courses are continuously updated, specific topics or methods of approach may vary from term to term.

- 05.128 Work Design** 4 Q.H.
Topics include principles of work physiology; workplace design from the standpoint of employee safety and effectiveness; work measurement techniques, including direct measurement, synthetic standards, and work sampling.
- 05.130 Systems I** 4 Q.H.
(Prereq. 10.154)
Topics include linear feedback systems and solutions of first-order systems; integral and derivative control; Laplace transforms for continuous systems analysis and Z-transforms in discrete systems; transfer functions; use of

the DYNAMO language to simulate complex feedback systems.

05.131 Systems II 4 Q.H.

(Prereq. 05.145, 05.240, and 05.161)

The course examines analysis and design of major industrial engineering systems. Students are expected to undertake up to five projects drawn from line balancing, job shop scheduling, stochastic network analysis, reliability in design, complex queuing system design, sequencing, or other areas of student and faculty interest.

05.145 Probabilistic Analysis for Engineers 4 Q.H.

(Prereq. Integral & Differential Calculus)

Probability theory presented axiomatically, with emphasis on sample space representation of continuous and discrete random variables. Material will cover standard distributions. Topics include expectation, transform techniques, and change of variable.

05.147 Statistics I 4 Q.H.

(Prereq. 10.208)

The course examines definition of a statistic; distributions of random variables, including normal, t , chi-square, F , Poisson, binomial; estimation of parameters, point estimation by method of moments, maximum likelihood, and Bayes estimates.

05.148 Statistics II 4 Q.H.

(Prereq. 05.147)

Topics include interval estimation, stating and testing hypotheses, linear regression, analysis of variance, applied topics such as reliability and decision theory from Bayes rule.

05.149 Reliability and Quality Control 4 Q.H.

(Prereq. 05.147)

Applied probability and statistical inference techniques are utilized in reliability analysis and quality control. Both theory and application are discussed in relation to the total quality assurance program.

05.150 Industrial Cost Control 4 Q.H.

Topics include fundamental concepts of accounting, with emphasis on using financial records to make engineering decisions. Study of financial statements of a firm. Contrast in usefulness of data from absorption costing vs. direct costing. Interpretation of variance accounts.

05.161 Operations Research I 4 Q.H.

(Prereq. 10.154)

Topics include deterministic models, including LP and duality; transportation and allocation; sensitivity and post-optimality analyses. Network analysis, including maximal flow, shortest route, and PERT; dynamic programming and recursive functional expressions; game theory.

05.163 Operations Research II 4 Q.H.

(Prereq. 05.147)

The course focuses on the stochastic models in OR; their analytical development and solution.

Topics covered include queuing, models, deterministic and stochastic inventory models, Markov chains, and sequencing.

05.165 Production and Inventory Control 4 Q.H.

(Prereq. 05.145 or equiv.)

Topics include basic inventory models and inventory management systems. Single-stage and multi-stage systems and their dynamics. Production control and aggregate planning. Mathematical and heuristic approaches to aggregate scheduling. Cost structure and decision-oriented analyses. Consideration of job shop scheduling and dispatching problems.

05.166 Facilities Design 4 Q.H.

(Prereq. 05.161)

The course examines use of descriptive and optimizing models (e.g., simulation, queuing theory, and linear programming) to design facilities and associated materials-handling systems. Computer-assisted layout analysis techniques are applied to problems of real-world scope.

05.167 Material Handling System Design 4 Q.H.

(Prereq. 05.161)

The course covers design and analysis of large material-handling systems. Topics include computer control of handling systems, integration with production and inspection, automated storage/retrieval systems, automatic identification systems, and systems acquisitions.

05.170 Human Considerations in Engineering Design 4 Q.H.

This is an introductory human factors course with emphasis upon the physiological and anthropometric bases of equipment and workplace design. Topics include: (1) thermal regulation and heat stress; (2) work and fatigue; (3) acceleration and whole-body vibration stress; (4) ambient noise and auditory system damage; (5) body measurements and equipment design. As feasible, theory is related to student experiments.

05.171 Human Factors 4 Q.H.

This is an introductory course with emphasis upon human sensory/motor performance and information-processing capabilities. Includes application to the design and performance of human/machine systems. Topics include: (1) function and performance of the visual and auditory senses; (2) concepts of information theory and signal-detection theory; (3) cognitive channel capacity and selective attention. The course is built around a series of experiments that explore theories of human performance in skilled-task execution.

05.186 People in Organizations 4 Q.H.

(Prereq. Seniors only)

Topics include the individual in the work environment: work theory, motivation, and interpersonal relations based on the concepts of the behavioral sciences; structure and dynamics of organizations; problems of innovation; case studies

for situational analysis to assist students who wish to develop skill in applying behavioral concepts.

05.201 Principles of Computation and Programming I 4 Q.H.

(Prereq. FORTRAN)

The course covers review of algorithms, computers, and programming. Machine language programming (instruction, execution, and addressing techniques). Coding and representation of data. Program debugging and verification. Survey of machines, devices, and languages.

05.240 Digital Simulation Techniques 4 Q.H.
(Prereq. FORTRAN and 05.147 or 05.245)

The course covers design and construction of digital, discrete simulation models. Extensive use of FORTRAN and GPSS simulation language. Discussion of model logic and specification, testing, validation, and use. Several simulation projects using the North-eastern computer facilities.

05.241 Management Information Systems 4 Q.H.

Topics include managerial applications of digital computers; the use of computers in information, decision-support systems; information-based theories of management; survey of information technology; computer system basics; cost and value of information; system design, analysis, equipment selection; organizational implications.

05.245 Basic Engineering Statistics 4 Q.H.

(Not open to industrial engineering majors)

The course covers introduction to basic probability distributions, including the binomial and hypergeometric, exponential, Poisson, and normal; laboratory data analysis.

05.260 Engineering Economy 4 Q.H.

(Not open to industrial engineering majors)

Topics include the formulation of analytical techniques, i.e., rate of return, present worth, and annual cost. The application of these techniques to solve business and engineering problems involving design, selection, replacement, lease-buy decisions, and decisions between multiple alternatives. Sensitivity analysis and basic probability are introduced in cases where uncertainty exists. Brief survey of sources and costs of capital, debt-versus-equity financing, and leverage.

05.261 Engineering Economy and Statistical Decision Theory 4 Q.H.

(Prereq. 05.145 or 10.208)

The objective of the course is to familiarize the student with the theory and techniques of economic evaluation of an investment project. Introductory steps in the analysis of investment proposals, time value of money, and cash flows; analysis of deterministic and stochastic cash flows in terms of present worth, annual cost, rate of return, and benefit/cost ratio. Decision tree for sequential decisions, criteria for decision making under uncertainty, utility theory, value of information, effect of accounting procedures and taxes on investment analysis. Case studies involving replacement, lease, engineering design, and public projects.

05.290 Independent Study in Industrial Engineering 1-4 Q.H.

Independent study on advanced I.E. topics for students usually in the senior year and with high scholastic standing. Projects may be of an applied or theoretical nature; formal report submitted to student's project supervisor at the end of quarter.

Computer Science

06.100 PASCAL I 4 Q.H.

(Prereq. None)

Introduction to computers and computer programming using the language PASCAL. Brief overview of text editing and system commands. Basic concepts of PASCAL: built-in data types, variables, assignment, expressions, and input/output. Tools for structured programming: flow control constructs, procedures and functions, user-defined data types using arrays, records, and strings. Techniques for input/output to terminals and text files. Assignments will emphasize how to design programs systematically through the use of structured sub-units.

06.101 PASCAL II 4 Q.H.

(Prereq. 06.100)

A continuation of the study of the programming language PASCAL and its applications.

Recursion and stacks. Quicksort. Pointer data types. Singly and doubly linked lists. Introduction to trees. Files of some fixed data type. Use of procedures and functions as parameters. Sets. Variant records. Elementary graphics, if available on the computer being used.

06.102 LISP 4 Q.H.
(Prereq. 06.101)

This course introduces the fundamental concepts and applications of LISP programming and their relationship to computer science. Basic ideas underlying symbolic information processing and the role of LISP in this context. Practical examples of how LISP is used in computer science and industrial contexts. Discussion of how LISP relates to some important areas of computer science, namely: (1) LISP as the "systems language" of artificial

intelligence, (2) LISP as an important example for the study of issues in programming language design and implementation, (3) LISP and functional languages, and (4) LISP as a tool for procedural and data abstraction and for the development of data-driven programs.

06.110 FORTRAN Lab 1 Q.H.
(Prereq. 06.100)

The course offers an introduction to the elements of FORTRAN programming, including I/O, subprogram linkage, and methods of structured programming in FORTRAN.

06.111 DCL Lab 1 Q.H.
(Prereq. 06.100)

Course includes elements of command language; procedure files and parameter exchange; device handling for both tapes and disks; detailed coverage of the command language for the computer at the Academic Computer Center.

06.112 LISP Lab 1 Q.H.
(Prereq. 06.100)

The course focuses on elements of the list processing language LISP. (Given prior to Fall 1984 and to be replaced by the more extensive course 06.102)

06.113 COBOL Lab 1 Q.H.
(Prereq. 06.100)

An introduction to COBOL programming language for students who have already mastered another high level algorithmic language (such as PASCAL or FORTRAN). Topics include COBOL program structure, arithmetic and flow control, subroutines and procedures, report writing, searching, sorting.

06.130 Assembly Language I 4 Q.H.
(Prereq. 06.101)

An introduction to computer organization and programming at the assembly language level. Topics include arithmetic instructions, memory organization and data representation, addressing modes, flow control instructions, subroutines, procedures and linkage with higher level languages, run-time stack structure, implementation of recursion, floating point and blt instructions, terminal I/O using system services or higher level languages, use of the debugger.

06.131 Assembly Language II 4 Q.H.
(Prereq. 06.130)

Continuation of 06.130. User-defined macros, system macros; character string instructions and parsing; decimal instructions, conversion, and editing; queue instructions; exception handlers; record management and file operations; low level queue I/O services; introduction to other system services.

06.201 Data Structures 4 Q.H.
(Prereq. 06.101 and 10.210)

Introduction to complex data structures and corresponding algorithms for their manipulation. Arrays, lists, trees, sets, graphs, and

queues. Quicksort, heapsort, and an introduction to algorithm analysis. Height-balanced (AVL) trees. B-trees, including 2-3 trees. Hashing. As time permits, union and find operations on sets; depth-first search and shortest path algorithms on graphs; minimum cost spanning trees.

06.205 Software Design and Development 4 Q.H.
(Prereq. 06.201)

This course will present the latest ideas and techniques in software methodology and provide a means for students to apply these techniques. Students will be presented with several large programming projects. It will be their task, working in groups, to organize, to manage, and to implement some of the projects.

06.210 Computer Graphics 4 Q.H.
(Prereq. 06.201 and 10.246)

The course focuses on characteristics and programming of graphics output devices. Basics: point and line drawing, two-dimensional displays, clipping and windowing. Pictures: data structures and display file organization. Interaction: graphical input and external events—operating system considerations. Some three-dimensional drawing will be included as time permits.

06.220 File Structures 4 Q.H.
(Prereq. 06.201 and 06.131)

Access characteristics of secondary storage devices (tapes, disks and drums). External sorting and merging for heap files. Algorithms for common file operations on heap, hashed, ISAM, B-tree, dense indexes and TRIE file structures. Overflow techniques. Comparison of operations by block access count. Files with variable length records. As time permits, data compression techniques; structures for secondary access: multilist and inverted files; retrieval for partially specified records and ranges of records.

06.225 Data Base Management I 4 Q.H.
(Prereq. 06.220 and 10.210)

This course will emphasize the concepts and structures necessary to design and implement a data base application and survey some existing systems. Introduction to data base concepts. Data base modeling and entity relationship diagrams. Review of physical data organization. The relational model, QUEL, and ISBL. Design of a relational model and normal forms. Data definition and data manipulation languages for network and hierarchical models. Comparison of models, some languages and implementations for these models.

06.226 Data Base Management II 4 Q.H.
(Prereq. 06.225)

This course will focus on data base systems that support relational model applications. Topics will include recovery, query optimization, integrity, security and concurrency, with examples

based on INGRES and SYSTEM R. Additional topics such as data base machines may be covered at the discretion of the instructor. Students will implement a small relational DBMS.

06.228 Systems Programming 4 Q.H.
(Prereq. 06.111 and 06.131)

The purpose of this course is to familiarize the student with organization of the components of a computer operating system, their functions and mutual interactions. Assemblers, the structure of an object file and an executable file, linkers. Multiprogramming, multiprocessing, and time sharing. Memory management, device management, file management, libraries, I/O control, shared images.

06.230 Operating Systems I 4 Q.H.
(Prereq. 06.228)

In-depth study of algorithms and problems encountered in operating system design. Asynchronous concurrent processes, monitors, deadlocks, virtual performance measurement and evaluation, security.

06.231 Operating Systems II 4 Q.H.
(Prereq. 06.230)

Students will have the opportunity to gain hands-on experience working with a small operating system and writing programs to enhance its capabilities by implementing some of the algorithms studied in 06.230.

06.240 Analysis of Programming Languages 4 Q.H.

(Prereq. 06.102, 06.110, 06.260, and 06.201)
Language design criteria and the evaluation of programming language concepts in terms of their contribution to the software development process. Topics will include interpretations vs. translation; binding; variables: scope, lifetime, value, type; structure of ALGOL-like languages: activation records; accessing the global environment, static chain and display; data types: strong typing, implementation models; control structures: sequencing, selection, repetition, subprograms, exception handling, coroutines and concurrent units; functional programming. The course examines and compares existing languages such as FORTRAN, PASCAL, C, ALGOL 60, ALGOL 68, Ada, FLI, Concurrent PASCAL, Simula 67, LISP, CLU, APL, and SNOBOL 4.

06.250 Automata and Formal Languages 4 Q.H.

(Prereq. 06.201 and 10.210)
Topics include finite-state machines and regular expressions; context-free grammars; parsing of deterministic context-free languages; pushdown automata; pumping theorems for regular and context-free languages; Turing machines, Church's thesis and the halting problem.

06.260 Compiler Design I 4 Q.H.
(Prereq. 06.131 and 06.250)

This is a course on the front end of a compiler. Quick review of FSA and language terminology. Topics include lexical analysis, recursive descent parsing, look-ahead parsing, precedence parsing, syntax-directed translation and syntactic error recovery. Particular emphasis will be on LALR (1) parsing as it is used in compiler-compilers. Possible projects include writing a recursive descent parser for a small language and/or practice using a compiler-compiler.

06.261 Compiler Design II 4 Q.H.
(Prereq. 06.260)

This is a course on the middle phase and back end of a compiler. It includes static issues such as type checking, symbol table organization, scope rules, and aggregate types such as arrays and records. Run-time structure, code optimization techniques and error recovery. Students will construct a compiler using a compiler-compiler for the front end and will write their own back end.

06.265 Analysis of Algorithms 4 Q.H.
(Prereq. 06.201, 10.152, 10.210 and 10.246)

This course introduces the basic principles and techniques of analyzing algorithms. Topics include algorithms on sorting, searching, graphs, and digraphs (such as minimal spanning tree, shortest path, depth-first search, components of a graph); methods involving string matching, polynomials and matrices. If time permits, fast Fourier transform and the concept of NP-complete problems.

06.280 Artificial Intelligence 4 Q.H.
(Prereq. 06.102, 06.201 and 10.211)

This course focuses on analysis of current computer algorithms dealing with problems such as theorem proving, chess playing, general problem solvers, robotics, symbolic computation, perceptrons, self-reproducing automata and parallel machines.

06.290 Directed Study in Computer Science 4 Q.H.

(Prereq. Permission of the instructor. May be repeated for credit)

Programs of directed study, held one or more quarters, are available for highly motivated students who wish to explore special topics in computer science in depth. Directed study can be used as an opportunity to examine familiar material in fresh ways or to explore new material that is not offered in formal courses. It is hoped that directed study programs will provide students strong in computer science and related sciences a chance to develop the art and skill needed to work independently and creatively in computer science.

06.291 Computer Science Project 4 Q.H.

(Prereq. Permission of the instructor. May be repeated for credit)

A course for those who wish to develop a special software project with the assistance of a member of the faculty.

06.296 Computer Science Seminar 1 Q.H.

(Prereq. Computer science seniors only)

A seminar is held once a week on a current topic or problem in computer science. Students are then assigned additional questions and/or problems to research in the topic presented to help them develop a deeper appreciation and understanding of various aspects of computer science.

Engineering Technology

Mechanical Engineering Technology

02.411 Mechanics A 4 Q.H.

(Prereq. 10.420; or 10.620; 11.417 or 11.617)

Topics include forces, moments, couples, statics of particles and rigid bodies in two and three dimensions. Distributed forces: external and internal. First moments and centroids. Analysis of structures: trusses, frames, and machines.

02.412 Mechanics B 4 Q.H.

(Prereq. 02.411 or 02.611)

Topics include friction, second moments, and virtual work. Kinematics of particles: rectilinear and curvilinear motion of dynamic particles. Force, mass, and acceleration; work and energy.

02.413 Mechanics C 4 Q.H.

(Prereq. 02.412 or 02.612)

Topics include impulse and momentum of particles. Kinematics and dynamics of rigid bodies: force, mass, and acceleration. Dynamics of rigid bodies: work and energy, impulse and momentum. Introduction to mechanical vibration.

02.414 Stress Analysis A 4 Q.H.

(Prereq. 02.411 or 02.611)

Topics include axially loaded members; stress and strain, allowable stresses, factor of safety, temperature effects, indeterminate members; thin-walled pressure vessels; centric loading of bolted and welded connection; shear and moment in beams; eccentrically loaded connections; flexural and transverse shearing stresses in beams.

02.415 Stress Analysis B 4 Q.H.

(Prereq. 02.414 or 02.614)

Topics include determinate and indeterminate beam deflections and reactions by numerical and graphical integration and area moment methods; theorem of three moments. Torsional stresses and strains; power transmission; eccentric loads on struts, beams, riveted and welded joints; combined and principle stresses; Mohr's circle; theories of failure.

02.416 Stress Analysis C 4 Q.H.

(Prereq. 02.415 or 02.615)

Topics include curved beam, asymmetrical bending of beams, shear-center and shear stresses on thin sections, composite beams.

Columns, energy absorption and resilience, inertial stresses, impact loading, deflection of beams by energy methods.

02.419 Mechanics 4 Q.H.

(Prereq. 10.420 and 11.417)

Kinematics of particles: rectilinear and curvilinear motion of dynamic particles. Force, mass, and acceleration; work and energy. Impulse and momentum of particles. Kinematics and dynamics of rigid bodies: force, mass, and acceleration. Dynamics of rigid bodies: work and energy, impulse and momentum.

02.421 Thermodynamics A 4 Q.H.

(Prereq. 11.418 or 11.618)

Topics include general theory of heat and matter, laws of thermodynamics, energy-transformation principles; availability of energy; properties and processes for pure substances and ideal gases. Thermodynamic properties and processes of liquids and vapors; tables and charts; mixtures of fluids; vapor cycles.

02.422 Thermodynamics B 4 Q.H.

(Prereq. 02.421 or 02.621)

The course covers theory of vapor engines and analysis of actual engine types using gas and vapor compression; internal combustion engines; theory of gas and vapor flow through orifices and nozzles; principles of gas compression; analysis of vapor compression; refrigeration systems; low-temperature refrigeration cycles; and absorption refrigeration systems.

02.423 Refrigeration and Air Conditioning

(Prereq. 02.422 or 02.622)

The course focuses on air conditioning principles, including psychometrics and heat pumps. Course covers calculation of heating and cooling loads in accordance with A.S.H.R.A.E. practices; principles of gas compression; analysis of vapor compression; refrigeration systems; low-temperature refrigeration cycles; and absorption refrigeration systems.

02.430 Heat Transfer 4 Q.H.

(Prereq. 02.422 or 02.622)

Topics include the primary modes of heat transfer; thermal conductivity; thermal conduc-

tance/resistance concept; thermal-electrical analogy; combined heat-transfer mechanisms; basic equations of conduction; analytical solutions of various steady-state conduction problems. The course also covers dimensional analysis and similarity considerations; natural and forced convection; hydrodynamic and thermal boundary layers; black-body radiation; Kirchhoff's law; emissivity and absorptivity; radiation between simple bodies; numerical methods; log mean temperature differences; overall heat-transfer coefficients; heat exchanger effectiveness; tubular exchanger design; regenerative and evaporative heat exchangers; heat-transfer engineering problems.

02.431 Materials A 4 Q.H.

Lectures on fundamental metallic structures; general metallurgical information covering theoretical aspects of properties, testing, and failure of metals. Supplemented by visual aids. Lectures on alloying and hardening of metals, refinement of metals, equilibrium diagrams, characteristics of engineering metals, principles of metal fabrication.

02.432 Materials B 4 Q.H. (Prereq. 02.431 or 02.631)

The course focuses on the study of inorganic materials (polymers, glasses, ceramics, cements, wood) and materials having important electrical and magnetic properties. A summary of the most recent applications for the fabrication and uses of both metals and nonmetals. Structures of metals, imperfections, phase diagrams, effect of temperature on structure and properties of metals (annealing, recrystallization, recovery, precipitation, diffusion), strengthening mechanisms, mechanical properties of nonferrous metals. Laboratory: experiments in preparation of samples, selection, polishing, and etching; examination of nonferrous metals, use of the microscope, linear analysis, construction of cooling curves, and simple binary phase diagrams.

02.433 Applied Metallurgy 4 Q.H. (Prereq. 02.432 or 02.632)

Lectures include mechanical properties of ferrous metals; the iron-carbon diagram; high-temperature alloys, hardening methods, impact tests, effects of environment on metals. Manufacturing processes; methods of fabrication, limitations on the use of different materials and their processing, casting, welding, cutting, drawing, powder metallurgy. Laboratory: includes experiments on analysis of stress-strain diagrams of iron and steel, heat treatment of steels; surface corrosion; tempering and drawing; use of metallograph and analysis of the results. Experiments in cold rolling, swagging, drawing of nonferrous metals, and analysis of the results. Tension, shear, fatigue, and machinability tests on ferrous metals.

02.443 Fluid Mechanics A 4 Q.H. (Prereq. 02.412 or 02.612)

Topics include hydrostatics; principles governing fluids at rest; pressure measurement; hydrostatic forces on submerged areas and objects; simple dams; fluids in moving vessels; hoop tension; fluid flow in pipes under pressure; fluid energy, power, and friction loss; Bernoulli's Theorem; flow measurement.

02.444 Fluid Mechanics B 4 Q.H. (Prereq. 02.433 or 02.643)

The course covers pipe networks and reservoir systems; flow in open channels; uniform flow; energy, friction loss, minor losses, velocity distribution, alternate stages of flow, critical flow; nonuniform flow; accelerated and retarded flow; hydraulic jump and waves.

02.451 Mechanical Vibrations 4 Q.H. (Prereq. 02.413, 02.613)

Elements of vibrating systems; one degree of freedom (undamped free and forced vibration from Newton's law of motion and energy methods); natural frequencies; damped free and forced vibration; impedance and mobility; systems with more than one degree of freedom; influence coefficients, Lagrange's equations, generalized coordinates, vibration absorber.

02.452 Experimental Stress Analysis 4 Q.H. (Prereq. 02.415 or 02.615)

Theory and experimentation showing the application of extensometers and electrical strain gauges as transducers in the field of experimental stress and strain analysis. Theory and laboratory practice; photoelastic methods as applied to classical model analysis and modern coating analysis.

02.461 Machine Shop 4 Q.H. Introduction to study of machines for metal processing, cutting tools, and fluids. Machinability, automatic machinery.

02.473 Measurement & Analysis Lab. 2 Q.H. (Prereq. 02.414 or 02.614; 06.400 or 06.600; 10.422 or 10.622; 11.419 or 11.619)

The course includes experimental procedures for the collection and analysis of data by graphical and numerical methods including computer applications, report writing that draws conclusions relative to accuracy, precision, true values, and measured values as they relate to basic mechanical measuring instruments for length, area, volume, specific gravity, pressure, temperature, and time as these parameters are utilized in making mechanical measurements.

02.474 Technology Lab A 2 Q.H. (Prereq. 02.473 or 02.673; 02.415 or 02.615; 02.431 or 02.631; or concurrently)

The course includes experimental procedures to determine mechanical properties of materials under tensile, compressive, torsional, direct shear, flexural, impact, fatigue, and creep loading conditions as they are affected by normal

and abnormal environmental conditions; also as they are affected by homogeneity, non-homogeneity, isotropy, and non-isotropy.

02.475 Technology Lab B 2 Q.H.
(Prereq. 02.473 or 02.673; 02.443 or 02.643; or concurrently)

The course includes experimental procedures to determine the physical properties of incompressible fluids and to measure the flow rates and velocities utilizing pilot tubes, orifice plates, venturii and weirs flow meters, U-tube differential manometers, and piezometers as the fluid flows through open channels, partially filled conduits, conduits under pressure, pipe networks, turbines, and pumps.

02.476 Technology Lab C 2 Q.H.
(Prereq. 02.473 or 02.673; 02.422 or 02.622; or concurrently)

The course covers basic thermodynamic relations; experimental procedures to examine the flow of compressible fluids and steam, and the energy conversion of a fuel into a working substance and the related heat-transfer mechanisms. Operating characteristics of thermal generators, engines, and compressors.

02.477 Technology Lab D 2 Q.H.
(Prereq. 02.476 or 02.676; 02.422 or 02.622; 02.430 or 02.630; or concurrently)

The course includes experimental procedures to examine the operating characteristics and efficiencies of internal combustion engines, brake horsepower, indicated horsepower, friction horsepower, mean effective pressure, fuel consumption, torque, ignition timing, manifold pressure, and compression ratios and internal engines as energy conversion systems; energy conversion of fuels.

02.478 Technology Lab E 2 Q.H.
(Prereq. 02.473 or 02.673; 02.423 or 02.623; 02.430 or 02.630)

The course includes experimental, analytical, and design projects to examine refrigeration, air conditioning, and heating-pump cycles.

02.479 Power Generation 4 Q.H.
(Prereq. 02.422 or 02.622)

Topics include basic power generation cycles; gas turbine cycles; effects of combustor temperature, intercooling, etc., on cycle performance; Rankine regenerative cycles; effects of steam temperature, pressure, number of feedwater heaters, etc., upon performance; steam generation equipment: boilers, reactors.

The course also covers fossil fuel characteristics and effects on boiler design; combustion analysis; draft calculations; axial and centrifugal fan performance characteristics; pump design and performance consideration; heat-exchanger design considerations.

The course also includes applications of principles of economics to cycle and performance considerations; use of load curves;

economic considerations of heat rate; economics of equipment selection; study of auxiliary equipment such as precipitators and flue-gas desulfurization systems.

02.480 Mechanical Design A 4 Q.H.
(Prereq. 02.415 or 02.615; 02.431 or 02.631)

The course covers introduction to mechanical design, the design process, design factors, creativity, optimization, human factors, value engineering. These principles are discussed and developed through simple design projects. Principles of design, properties and selection of materials; stress concentrations; strength under combined stresses; theories of failure; impact and fluctuating and repeated loads.

02.481 Mechanical Design B 4 Q.H.
(Prereq. 02.480 or 02.680)

Topics include stresses; deformation and design of fasteners, screws, joints, springs, and bearings; lubrication and journal bearings. Stresses and power transmission of spur, bevel, and worm gear; shaft design; clutches and brakes.

02.499 Special Problems in Mechanical Engineering Technology 4 Q.H.
(Prereq. Consent of Department Chairperson)
Theoretical or experimental work under individual faculty supervision.

Electrical Engineering Technology

03.410 Electrical Measurements 4 Q.H.
(Prereq. 03.453)

The course covers standards of measurements; dimensional analysis; errors and measurement of dispersed data; discrete and continuous variables; binomial distribution; normal distribution; guaranteed error; methods of resistance measurements; digital voltmeters and analog to digital conversion; voltage references; potentiometers and a.c. bridges.

03.411 Electronics I 4 Q.H.
(Prereq. 03.452)

Topics include semiconductor diodes and applications, transistor-biasing techniques, graphical analysis of basic amplifiers, d.c. and a.c. load lines.

03.412 Electronics II 4 Q.H.
(Prereq. 03.411)

Topics include small-signal, low-frequency transistor models; gains and impedances at midband; frequency effects in transistor circuits; multistage circuits; transistors used as current sources.

03.413 Electronics III 4 Q.H.
(Prereq. 03.412)

The course covers review of Bode plots, transistor circuits at low and high frequencies, feed-

back operational amplifiers, differential amplifiers, applications.

03.414 Pulse & Digital I **4 Q.H.**
(Prereq. 03.411)

The course covers switching characteristics of semiconductor devices; wave generation and shaping, using combinations of passive and integrated circuit components; comparators, hysteresis, and the dual ramp analog to digital converter-voltmeter circuits; voltage-to-frequency conversion.

03.415 Pulse & Digital II **4 Q.H.**
(Prereq. 03.414)

Topics include digital operations; logic statements and theorems; minimization of logic functions; logic gates and the characteristics of the integrated logic families; flip-flops, counters and registers; introduction to sequential circuit design; sample and hold circuits; analog to digital conversion.

03.417 Principles of Communication Systems I **4 Q.H.**
(Prereq. 03.413)

Topics include signal analysis using Fourier methods; noise in communication systems; frequency selective amplifiers, including wide-band; transistor power amplifiers AF and RF; oscillators; signal sources and applications.

03.418 Principles of Communication Systems II **4 Q.H.**
(Prereq. 03.417)

The course covers basic theory of amplitude, frequency, phase and pulse code modulated systems; analysis of modulating and demodulating circuits; carrier systems using SSB; system block and level diagrams; logic control circuits in communication systems; modems.

03.419 Principles of Communication Systems III **4 Q.H.**
(Prereq. 03.418)

The course covers fundamentals of digital communications; sampling requirements; analog-to-digital conversion methods; system capacity and bandwidth; comparison of practical digital systems PAM, PCM, PFM, PWM; time and frequency division multiplexing; data decoding; selected examples from telemetry and computer links.

03.420 Electricity and Electronics I **4 Q.H.**
(Prereq. 10.420 and 11.419)

The course covers introduction to circuit analysis, resistive networks, periodic excitation function, steady-state a-c circuits; the physical foundations of electronics and the physical operation of electronic devices

03.421 Electricity and Electronics II **4 Q.H.**
(Prereq. 03.420)

The course covers single-stage electronic circuits, magnetic circuits and transformers, electro-mechanical energy conversion, d-c machines, a-c machines.

03.423 Electronic Laboratory **2 Q.H.**
(Prereq. 03.412 or concurrently)

The course covers experiments dealing with laboratory equipment (meters and oscilloscopes) techniques; junction and field-effect transistor characteristics; vacuum and semiconductor diodes; power supplies, including the regulated type; silicon-controlled rectifiers; resistance-coupled amplifiers using transistors, including feedback methods.

03.424 Circuits Laboratory I **2 Q.H.**
(Prereq. 03.451)

The course covers experimentation in electronic circuit theory utilizing various measurement techniques. Instrumentation verification of circuit theorems; response of circuits to steps and impulses; oscilloscope theory and applications.

03.425 Circuits Laboratory II **2 Q.H.**
(Prereq. 03.424)

The course offers further experimentation in electrical circuits and measurement techniques. Experiments include response of circuits to steps and impulses, nonlinear devices, terminal characteristics of active devices, log modulus plots, network parameters and synthesis. Fourier analysis and synthesis.

03.427 Advanced Electronics Laboratory I **2 Q.H.**
(Prereq. 03.423)

The course covers experiments dealing with the use of oscilloscopes, the examination of transistor audio amplifiers, push-pull amplifiers, drivers, pulse and video amplifiers, transients and wave-shaping circuits, audio frequency oscillators, and the study of operational amplifiers.

03.428 Advanced Electronics Laboratory II **2 Q.H.**
(Prereq. 03.427)

The course covers experiments dealing with the modulation of a class C amplifier, the diode detector, basic timing circuits, RF and crystal oscillators, astable multivibrators, logic gates, flip-flops, binary adders, registers and counters; active filters, frequency modulation detectors, and analog-to-digital and digital-to-analog conversion.

03.429 Advanced Electronics Laboratory III **2 Q.H.**
(Prereq. 03.428)

Topics include spectral studies of FM and PM waves, amplitude limiters; the balanced modulators and single sideband generators; integrated circuit timers and monolithic random access memory; monolithic phase-locked loop as well as a series of microwave experiments and digital experiments.

03.430 Energy Conversion **4 Q.H.**
(Prereq. 03.452 and 10.422)

Topics include generalized theory of rotating energy conversion devices; steady-state

operation of the multiply excited direct-current machine; control of speed; special machines; transformers; steady-state considerations of induction and synchronous machines; generalized machine and circuit model; Laplace transform techniques applied to the analysis of dynamic operating modes of rotating machines.

03.437 Distributed Systems 4 Q.H.
(Prereq. 10.422 and 11.419)

Topics include radiation, transmission, and reception of electromagnetic waves; distributed-line constants and traveling waves of transmission lines; differential equations of the uniform line.

03.451 Circuit Analysis 4 Q.H.
(Prereq. 10.420 and 11.419)

Topics include Ohm's law, Kirchhoff's current and voltage laws, equivalent resistances and sources, mesh and modal analysis, network theorems, two-port networks and power relations—all with respect to direct currents; energy storage, singularity functions, response of R, L, and C elements to singularities.

03.452 Circuit Analysis II 4 Q.H.
(Prereq. 03.451)

Topics include complex algebra, phasors, frequency domain, mutual inductance, transformers, steady-state a-c theory, driving point and transfer impedances, power and energy in a-c circuits; Laplace transforms; partial fraction expansion; Laplace transform techniques applied to the solution of RLC networks.

03.453 Circuits Analysis III 4 Q.H.
(Prereq. 03.452)

The course covers application of differential equations to the solutions of linear, time-invariant electrical networks; introduction to singularity functions, convolution, and time-domain transient analysis; network topology and duality; introduction to the methods of transformation calculus and complex frequency concepts.

03.454 Circuits Analysis IV 4 Q.H.
(Prereq. 03.453)

Topics include signal analysis in the frequency domain; Fourier series; Fourier and Laplace transform methods; a varied selection of circuit problems using Laplace transforms and related theorems.

03.460 Engineering Analysis I 4 Q.H.
(Prereq. 10.422, 03.452)

The course covers linear algebra and its application to circuit equations, solution of linear differential equations including an introduction to Laplace transforms.

03.462 Basic Power Systems I 4 Q.H.
(Prereq. 03.454)

Topics include consideration of power transmission lines; line constants; current voltage

and power relations; introduction to electric-power distribution loads, feeders, and substations; application of matrices.

03.463 Basic Power Systems II 4 Q.H.
(Prereq. 03.462)

Topics include consideration of symmetrical and unsymmetrical faults; protective devices—application and coordination; power flow in electric circuits; steady-state power limitations of systems; voltage regulation theory and application.

03.464 Basic Power Systems III 4 Q.H.
(Prereq. 03.463)

Topics include computer applications to power systems with emphasis on load-flow studies; basic ideas of systems planning, short-circuit studies, and system stability.

03.470 Digital Computers 4 Q.H.
(Prereq. 03.411)

Introduction to digital computer design. Topics include general computer organization, number systems and number representations, design characteristics of major computer units, Boolean algebra applications to computer design.

03.471 Digital Computers II 4 Q.H.
(Prereq. 03.470)

Examination of microprocessor architecture and organization. Study of the machine language and assembly coding of an industry-accepted microprocessor. A suitable topic from the current literature will be analyzed. Assembly language coding problems will be assigned.

03.477 Control Engineering I 4 Q.H.
(Prereq. 03.454 and 10.422)

Topics include analysis of linear servomechanisms under both transient and steady-state conditions; signal flow graphs; Laplace transforms used in the formulation of block diagrams and transfer function.

03.478 Control Engineering II 4 Q.H.
(Prereq. 03.477)

Topics include system stability; root locus techniques; treatment of Nyquist criteria and Bode diagram methods for systems evaluation.

03.490 Optical Instrumentation 4 Q.H.
(Prereq. 10.408 and 11.419)

The course focuses on telescopes, microscopes, etc., as optical system components. Includes magnification, aberrations, resolution criteria, photometry. Compatibility of system components and optimization of systems. The basic nonimage-forming systems used for analysis control and metrology.

03.498 Special Problems in Electrical Engineering Technology 2 Q.H.
(Prereq. Consent of Department Chairperson)

The course offers theoretical or experimental work under individual faculty supervision.

03.499 Special Problems in Electrical Engineering Technology 4 Q.H.
(Prereq. Consent of Department Chairperson)
The course offers theoretical or experimental work under individual faculty supervision.

Chemical Engineering Technology

04.481 Nuclear Technology 4 Q.H.*
(Prereq. 10.422 and 11.319)
Atomic and nuclear structure; discovery and nature of radioactivity. Nuclear reactions and energy, induced nuclear transformations, neutron properties, applications of radio nuclides. Radiological safety: nuclear instrumentation for particle detection, monitoring, and experimentation. The fission process and its applications; nuclear reactors—their classification, design, and application; nuclear fuel processing; radioactive waste disposal. Supplementary laboratory experiments.

Graphic Science

09.108 Computer for Engineers 4 Q.H.
Introduction to use of computers in the solution of engineering problems; FORTRAN programming language. A survey of the organization and function of an elementary digital computer; the use of flowcharts in developing program logic; establishing and manipulating tables, arrays, and matrices in memory; using subprograms and subroutine packages; and graphical output on an X-Y plotter.

09.109 Engineering Graphics and Design 4 Q.H.
The orthographic system as a means of depicting three-dimensional objects and concepts on a two-dimensional medium. Progression from principal views to auxiliary views and sections. Reading and interpreting detail and assembly drawings and depiction by means of pictorial drawings and sketches. Fundamentals of manufacturing processes and dimensions and their interrelations. Elements of design and student involvement by evaluation of existing design, components, and systems. The student as the creative designer-engineer.

09.130 Applied Programming 4 Q.H.
(Prereq. 06.100)
Elements of COBOL programming.

09.254 Microcomputer Programming 4 Q.H.
(Prereq. 09.108 or FORTRAN programming language)

A first course in microprocessor computing covers hex codes for assembly language. Basics of architecture model, programming model, and addressing modes. Instruction set for typical machine. Programming techniques and details for a 6502 processor. Hands-on laboratory experimentation with typical interfacing problems. Case studies in the area of developing applications. Laboratory experimentation in staffed facility.

09.255 Microprocessor Applications 4 Q.H.
(Prereq. 09.254, assembly language, or permission of instructor)

System architecture of several microcomputers, including microprocessors; bus design; multi-chip operation; and current trends in processors (8-, 16-, and 32-bit). Interfacing problems and hardware to include: sensors, actuators, D/A and A/D converters, data transmission, and parallel/serial I/O. Real-time programming with case studies. Network and distributed processing. Also included are development techniques and current state-of-the-art trends.

09.400 Computer Programming for Engineering Technology 4 Q.H.
(Prereq. —or concurrently—10.408)

Introduction to the use of computers in the solution of problems using FORTRAN on interactive terminals. Students write and run programs to compute sequences, averages, etc. Other capabilities of the FORTRAN language including DO loops, subscripted variables, and alphanumeric manipulation, matrix algebra, and numerical methods.

09.401 FORTRAN Engineering Computation 4 Q.H.
(Prereq. 09.400)

Professional methods for solving engineering problems with FORTRAN. Student will write and run programs using the University's computer. Topics include: subprograms, scientific software packages, solution of equations, data storage, reduction and display.

09.405 Introduction to Programming 4 Q.H.
A high-level structured language will be taught and used as a vehicle for implementing program. Students will write and run programs using N.U.'s computer. Topics: using N.U.'s computer, flow charting, program construction, computations involving maxima and minima, arrays, simple recursion, subroutines.

* Lab fee required.

09.410 FORTRAN 4 Q.H.

(Prereq. 09.405 or equiv.)

This important scientific language will be taught with engineering applications. Students will write and run FORTRAN programs using N.U.'s computer. Topics: arithmetic replacement, input, output, control and specification statements, looping, arrays, functions and subroutines.

09.415 PASCAL (A Second Language) 4 Q.H.

(Prereq. 09.400 or equiv.)

An introductory course in programming computers using the PASCAL language. Students will write and run programs using the University's computer facilities. This course may not be used as a technical elective in the Computer Technology Program.

09.420 COBOL 4 Q.H.

(Prereq. 09.405 or equiv.)

This important business language will be taught with general applications. Student will write and run COBOL programs using N.U.'s computer. Topics: divisions, names, rules, picture clauses, verbs, input/output instructions, levels, working storage, arithmetic, corresponding accept, display, compute, copy, undate logic, table logic, redefines, search, inline and COBOL sorts.

09.430 Nonnumerical Algorithms 4 Q.H.

(Prereq. 09.405)

Data; structures, storage, manipulation and retrieval methods. Students will write and run data manipulation programs using N.U.'s computer. Topics: stacks, queues, lists, trees, heaps, sets, graphs, searching, sorting, key processing, relational models.

09.435 Numerical Algorithms 4 Q.H.

(Prereq. 09.410)

Computer methods for solving mathematical problems. Students will write and run application programs using N.U.'s computer. Topics: deterministic vs. stochastic methods, random number generators, iterative vs. noniterative solutions, maxima and minima in 2 and 3 variables, curve fitting in 2 and 3 variables, integrals, trapezoidal and Simpsons rules, slopes, difference equations in 2 and 3 variables, vector and matrix algebra, simultaneous linear equations, nonlinear equations, permutations, and combinations.

09.440 Modern Programming Techniques 4 Q.H.

(Prereq. 09.405)

Structured methods for developing complex computer programs. Students will develop and write sections of complex programs. Students will run programs on N.U.'s computer. Topics: top down design, hierarchy diagrams, HIPO charts, composite design, structured analysis, team programming.

09.445 Assembly Language 4 Q.H.

(Prereq. 09.405)

A typical microprocessor assembly language will be taught. Students will write and run homework problems using a microprocessor simulator package implemented on N.U.'s computer. Topics: binary arithmetic, instruction sets, addressing modes, code conversion, subroutines, macros, I/O.

09.450 Basic Computer Organization 4 Q.H.

(Prereq. 09.405)

Fundamental aspects of basic computer components. Topics: the functions and general operating characteristics of CPU's, primary/secondary and mass memory, controllers, printers, card readers, terminals. What an operating system does, scheduling, monitoring, spooling, paging, system programs, virtual memory, multiprogramming, multiprocessing.

09.451 Advanced Computer Organization 4 Q.H.

(Prereq. 09.405)

The operating and performance characteristics of complex and special purpose components. Topics: how an operating system works, memory hierarchies, fiber optics, bubble memory, mass storage, computer networks, distributed processing, data flow, cache memory, associative memory, special purpose/parallel processors, system performance measures.

09.455 Micro Peripheral Hardware 4 Q.H.

(Prereq. 09.475)

The elements of microprocessor peripheral hardware and its interfacing. Students will configure microprocessor systems, using block diagrams showing relevant handshaking signals. Topics: serial and parallel I/O devices, DMA and interrupt control devices, bus arbitration, memory management units, counter timers as extensions of basic CPU functions.

09.456 Complex Peripheral Hardware 4 Q.H.

(Prereq. 09.455)

The interfacing and implementation of special purpose hardware. Students will configure systems, using block diagrams showing relevant handshaking signals. Topics: virtual memory, rotating media, printers, terminals, bus extension concepts, co-processors.

09.460 Industry Software 4 Q.H.

(Prereq. 09.451, 09.410)

A survey of current commercial software packages and methods. Students will exercise commercial packages implemented on N.U.'s computer where applicable. Topics: specific packages and methods which vary from year to year to maintain currency. They will be drawn from the following general categories: data base management, scientific and statistical analysis, security and privacy, software assurance, and documentation.

09.465 Industry Hardware 4 Q.H.

(Prereq. 09.456)

A survey of the latest industrial developments and trends in computer hardware. Conducted as a seminar.

09.468 Semiconductor Logic 4 Q.H.

(Prereq. 03.452)

A detailed analysis of the bipolar and MOS transistors in saturated and cutoff condition and implementation of these concepts to form basic logic and decision-making circuits. Students will convert logical expressions into hardware configuration representations. Topics: Ebers-Moll modeling, PMOS, NMOS, CMOS construction, logic families.

09.469 Computer Logic 4 Q.H.

(Prereq. 09.468)

An introduction to the hardware building blocks of general computers. Students will specify configurations of lower level components to achieve composite logical functions, e.g., construct a register from NAND gates. Topics: gates, flipflops, registers, decoders, ALUs, memory arrays.

09.470 Engineering Graphics I 4 Q.H.

The study of concepts and the development of skills to present and to analyze objects and systems used in design through the principles of graphical geometric constructions, orthographic projections (multi-view, two-dimensional drawings), and the design process. Assignments will include the layout of drawings on paper, solutions to graphical problems concerning objects and systems, and complete solutions to short problems using the design process.

09.471 Engineering Graphics II 4 Q.H.

(Prereq. 09.470)

Continuation of the study of concepts and the development of skills to present and to analyze objects and systems used in design including dimensioning, sectioning, threads, fasteners, assembly, and detail drawings as well as the design process. Assignments will require solutions to graphical problems that will require the studied graphical material and a progress report leading to the solution of a design problem.

09.474 Introduction to CPU Hardware 4 Q.H.

(Prereq. 09.445 or equiv.)

The internal operation of a microprocessor CPU. A black box approach is used. Students purchase and keep individual single board computers for doing homework and simulation. Topics: registers and timing control, programmable gate arrays, array processors as CPU models.

09.475 CPU Hardware Architecture 4 Q.H.

(Prereq. 09.474)

The performance characteristics of commercially available CPU's. Students will write code for 4 bit through 32 bit processors. Topics: the characteristics of 4004, 4008, 8080, Z80,

Z8000, 8086, 1802 F8 and 6800 processors, and how to use one processor in place of another. Note: the list of processors examined may vary from year to year to maintain currency.

09.480 Data Communication Methods 4 Q.H.

(Prereq. 09.410)

Functional and operational aspects of data communication devices and software. A black box approach will be used. Topics: modems, control units, multiplexers, concentrators, front end processors, synchronous/asynchronous/half duplex/full duplex codes and procedures, Bisynch/SDLE/HDLC, BYTE and BIT protocols, protocols, error checking, point to point/multidrop/STAR/MESH/CLUSTER networks.

09.481 Operating Systems 4 Q.H.

(Prereq. 09.451)

The basic principles of operating system implementation. Students write and run programs to exercise elements of the University's operating system when applicable. Topics: resource, memory, processor and device management commands and strategies, I/O programming, swapping, overlays, jobs and process scheduling, and other operating systems.

09.482 Computer Graphics Programming 4 Q.H.

(Prereq. 09.410)

Students are introduced to generalized techniques for the computer plotting of 2- and 3-dimensional shapes. Students write and run programs using the University's computer and digital plotter. Topics: 2D transforms, 3D to 2D transforms, 3D transforms, surface representation, shading, character, curve fitting, graphic data structures.

09.483 Data Bases 4 Q.H.

(Prereq. 09.430)

An introduction to data base organization structure and management. Students write and run programs exemplifying techniques developed in class on the University's computer. Topics: access methods, attributes, indices, keys, querying, searching and matching, file sets, normal forms, random access.

09.484 Large System Assembly Languages(Prereq. 09.445) **4 Q.H.**

Typical large computer system assembly languages. Students will write and run illustrative programs on the University's computer. Topics: edit and translate instructions, macro writing, program sectioning, linking, data representation, addressing, instruction formats in BAL and VAX-11 assembler languages.

09.485 Introduction to Simulation Programming 4 Q.H.

(Prereq. 09.435)

Computer methods for solving simulated phenomena. Students will write and run programs implementing simulations specified by instructor. Students will not be responsible for

the validity or evaluation of models except in simple cases. Topics: simple queues, multi-server queues, priorities including first in first out, last in last out, and time aging of data, simple frequency distributions, use of SIMULA, GPSS, and standard Subroutine Library Routines.

09.486 Development System Hardware 4 Q.H.
(Prereq. 09.475)

A study of the principal hardware capabilities and current trends in micro computer level system. Included are both single users and network-oriented system.

09.487 Bit Slice Micro Computers 4 Q.H.
(Prereq. 09.455)

The epitome of hardware flexibility is represented by the bit slice CPU. Demonstrates the basic design ground rules common to this style of hardware design.

09.488 Micro Controllers 4 Q.H.
(Prereq. 09.474)

The commercial segment of micro computers has been satisfied by a variety of single chip 4 bit micro controllers. A detailed contrast/comparison will be done on several of these devices, including the IMS-1000, S2000, COPS, and PPS-4.

09.489 Single Chip Microprocessors 4 Q.H.
(Prereq. 09.474)

When small 8 bit intelligent devices are rewired in high volume, the single chip microprocessor in the form of the 3870, 8084 Z8, and others comes into play. An understanding of the hardware limitations of single chip system presents the basis for this subject material.

09.490 Special Problems in Computer Technology 4 Q.H.

Theoretical or experimental work under individual faculty supervision.

Mathematics

10.100 Mathematics Preliminaries I 4 Q.H.
(Prereq. Permission of course coordinator)

The purpose of this course is to supply, together with 10.110, the high school math background necessary for a student to survive in 10.101, 10.104, or 10.118. Material includes the arithmetic of signed numbers, fractions, decimals, and percents; algebraic manipulation and solution of simple equations; elementary word problems; laws of exponents.

10.101 Basic Mathematics 4 Q.H.

The course examines systems of linear equations and their graphs. Graphing systems of linear inequalities in two variables with application to linear programming. Introduction to matrices, matrix multiplication, and vectors.

10.102 Basic Mathematics 4 Q.H.

Topics include introduction to probability, sample spaces with equiprobable events, permutations and combinations, conditional probability. Random variables, introduction to Markov processes.

10.104 Fundamentals of Mathematics 4 Q.H.

This course examines how to solve various kinds of algebraic equations: linear, quadratic, and linear systems in two and three unknowns. Applications to word problems such as motion, mixture, and variational problems. The concept of function, graphs, line slopes, and graphs of polynomials. Some elementary trigonometry and vectors in the plane.

10.105 Functions and Basic Calculus 4 Q.H.

The course provides an introduction to differential calculus. Elementary rules of differentiation with application to graph sketching

and to maximum and minimum problems. Exponential and logarithmic functions with applications to problems in compound interest, population growth, and radioactive decay.

10.107 Calculus 4 Q.H.

The course offers a review and continuation of differential calculus, graphing and differentiation of trigonometric functions, introduction to integral calculus with applications to geometric problems and to differential equations.

10.108 Probability, Statistics, and the Computer 4 Q.H.
(Prereq. Nonmath majors)

The course presents a computer-oriented introduction to statistical methods, with applications in the social and life sciences. Topics include descriptive statistics, elementary probability, correlation and regression, and the fundamentals of statistical inference (confidence intervals and hypothesis testing) with a minimum of mathematical derivations. A statistical computer package such as MINITAB or SPSS is used in solving supplementary problems.

10.110 Mathematics Preliminaries II 4 Q.H.

The purpose of this course is to supply, together with 10.100, the high school math background necessary for a student to survive in 10.101, 10.104, or 10.118. Topics include quadratic equations and systems of equations; graphing (including slope of a line and vertex of a parabola); more word problems; either logarithms, trigonometry, or some of both at the instructor's discretion; in winter and spring quarters the material covered in 10.100 will be assumed; in the fall quarter there is an overlap

with 10.100 on solving equations, word problems, and laws of exponents.

10.118 College Mathematics for Business 4 Q.H.
Topics include sets, rectangular coordinates and graphs, functions and functional notation, linear and quadratic functions, exponential and logarithmic functions, systems of linear equations, summations, inequalities, permutations and combinations, elementary probability concepts, arithmetic and geometric progressions, simple and compound interest, annuities.

10.119 Fundamentals of Mathematics 4 Q.H.
(Prereq. 10.118 or equiv.)

Topics include matrices; Gaussian elimination; inverses of matrices; systems of linear inequalities; feasible regions; graphical solution of linear programming problems; limits; derivatives; differentiation of polynomials; differentiation of exponential and logarithmic functions; maxima, minima, and points of inflection; optimization in nonlinear problems; marginal analysis of cost revenue and profit functions.

10.120 Introduction to Computers I 4 Q.H.
(Prereq. Nonmath majors)

This course has two goals: (1) to introduce computers and consider their applications, and (2) to introduce computer programming so that the uses and limitations of computers can be discussed intelligently. Small programs will be written and run. Applications such as sorting, searching, data processing, simulation, and artificial intelligence will be covered.

10.122 Numerical Methods with a Hand Calculator 4 Q.H.

Course covers the use of scientific hand calculator. Topics include the meaning and use of most of the keys, e^x , \ln , \log , and the trigonometric functions; RPN and algebraic notation; and a variety of computations that can be done easily on a scientific calculator—least squares, compound interest, solutions of equations, iteration techniques, difference equations, Euler's Method, difference quotients, and numerical integration. Techniques to promote speed and accuracy in using calculators for course work problems are emphasized. This course is intended for students who may take science courses.

10.126 Mainstreams of Mathematics 4 Q.H.
This course traces the development of mathematical thought by focusing on some of its most exciting aspects. Individual projects supplement lectures and readings, enabling students with diverse backgrounds to rediscover mathematics. The level is nontechnical; no more than high school algebra and geometry is assumed. Topics vary from year to year, but may

include mathematical games, a wide variety of puzzles, ancient number systems, logic and computers, calculus and the scientific revolution, art and symmetry. The course may be used to satisfy the math-science distribution requirement but not any major requirements.

10.130 Introduction to Computers and Computation 4 Q.H.

Course offers an introduction to problem solving with the use of computers. Students are expected to design, write, debug, and test programs in BASIC programming language. Course includes application of programming to a wide variety of problems, including statistical analysis of data, plotting, artificial intelligence, and text processing.

10.131 Introduction to Computer Science 4 Q.H.
This is a second course in programming, dealing with problem solving in the context of computing. Structured programming using PASCAL language. Correctness, clarity, and reliability of programs are stressed.

10.140 Mathematical Analysis IV-V 5 Q.H.
(Prereq. Freshman calculus or equiv.)

This course is designed to help prepare transfer students for numerical analysis and differential equations. Calculus of one and several variables. Linear algebra, vector-valued functions, multiple integration, infinite series, Taylor's theorem, and complex numbers.

10.144, 10.145 Calculus each 6 Q.H.
This course sequence is designed to assist students in overcoming deficiencies in pre-calculus mathematics without losing ground in the 10.150 sequence. The two quarters review high school algebra, introduce trigonometric functions, and cover the material in 10.150 and 10.151. The five meetings per week include lecture and homework review sessions. Students are placed in this course by request or on the basis of their College Board scores and the results of an orientation-week diagnostic test.

10.150 Calculus 4 Q.H.
This is a first course in calculus in one variable, primarily for engineering students. Functions, graphs, lines, limits, continuity, derivatives, chain rule, curve sketching, related rates, and maxima-minima problems are included.

10.151 Calculus 4 Q.H.
Continuation of 10.150. The integral in one variable with applications to areas, volumes, lengths, work, pressure, etc. Trigonometric, exponential, and logarithmic functions.

10.152 Calculus 4 Q.H.
Continuation of 10.151. Further techniques of integration, elementary differential equations, polar coordinates, and further applications are included.

10.153 Calculus 4 Q.H.

(Prereq. 10.152)

Topics include solid analytic geometry, vectors in 3-space, partial derivatives with applications, multiple integration.

10.154 Calculus 4 Q.H.

(Prereq. 10.153)

Topics include linear algebra, power series.

10.155 Mathematical Analysis 4 Q.H.

(Prereq. 10.154)

This course examines ordinary differential equations, with emphasis on methods of solution. Includes first-order equations, Laplace transform, second-order linear equations, and systems of first-order linear equations. (Intended primarily for engineering students.)

10.156 Mathematical Analysis 4 Q.H.

(Prereq. 10.155)

Topics include numerical methods for solving ordinary differential equations, Fourier series, and selected partial differential equations by separation of variables. (Intended primarily for engineering students.)

10.160 Calculus for Biology Majors I 4 Q.H.

This is a first course in calculus with applications to biology, ecology, and medicine. Differentiation, curve sketching, anti-differentiation, and exponential functions are included.

10.161 Calculus for Biology Majors II 4 Q.H.

(Prereq. 10.160)

Continuation of 10.160. Topics include exponential growth and decay; integration and area; rules for differentiation; and functions of several variables, with Lagrange multipliers, total differentials, and the method of least squares.

10.162 Calculus for Biology Majors III 4 Q.H.

(Prereq. 10.161)

Continuation of 10.161. Topics include the natural logarithm; trigonometric functions; techniques of integration, including numerical methods and differential equations, with separation of variables and qualitative methods.

10.170 Geometry 4 Q.H.

This course provides a careful look at classical Euclidean geometry, Hilbert's axioms for geometry, and models; geometries of Bolyai-Lobachevsky.

10.181 Calculus 5 Q.H.

This course is designed primarily for mathematics, physics, and chemistry majors. Syllabus for 10.181 through 10.183 includes derivatives and integrals of one-variable functions; applications to curve sketching, maxima and minima problems, area, moments, simple volumes, etc.; approximation methods, including numerical integration, root finding, Taylor series, and power series. Students will also be required to master the use of the computer to

make value tables and plot curves and to implement simple numerical algorithms.

10.182 Calculus II 5 Q.H.

(Prereq. 10.181) Continuation of 10.181.

10.183 Calculus III 5 Q.H.

(Prereq. 10.182) Continuation of 10.182

10.181 (H) Calculus for Honors Science Majors 4 Q.H.

An equivalent to 10.181, this course is designed to expose the student to a broader range of mathematical concepts while also presenting the basic calculus material that students learn in the nonhonors sections of 10.181. The course is especially intended for freshman honors science majors.

10.182, 10.183 Calculus for Honors Science Majors each 4 Q.H.

Continuation of 10.181 for winter and spring terms.

10.184 Calculus and Linear Methods I 4 Q.H.

(Prereq. 10.183)

The course focuses on methods of calculus and vector analysis to study curves, surfaces, and functions of several variables. Topics include parameterization of lines and planes, tangents and normal vectors, partial derivatives, maxima and minima problems, linear approximations, and tangent planes. Some linear algebra.

10.185 Calculus and Linear Methods II 4 Q.H.

(Prereq. 10.184)

Continuation of 10.184. Topics include multiple integration, line integrals, and exact differentials; various forms of Stoke's theorem; more linear algebra.

10.186 Differential Equations and Linear Methods I 4 Q.H.

The course focuses on ordinary differential equations and linear algebra. First-order equations, higher- (primarily second-) order linear differential equations, systems of linear differential equations. Linear algebra includes eigenvalues and eigenvectors, primarily for two-dimensional systems. Applications of ordinary differential equations.

10.187 Differential Equations and Linear Methods II 4 Q.H.

(Prereq. 10.186)

Topics include analysis of linear partial differential equations (wave equations, heat equation, and potential equation). Ordinary differential equations with boundary values. Fourier analysis, orthogonal functions. Also, numerical methods and other topics in ordinary differential equations.

10.206 Introduction to Analysis of Algorithms 4 Q.H.

(Prereq. 10.186)

The course offers theoretical study of algorithm design, evaluation of algorithms, and other algorithmic concepts and techniques useful for computer programming. Topics include graph

and matrix algorithms, testing primeness, factoring; evaluating greatest common divisors, linear Diophantine equations; evaluating square roots, logarithms, exponentials, etc.; truncation and round-off errors; random number generation; information organizational and retrieval; sorting.

10.208 Probability I 4 Q.H.
(Prereq. 10.154 or 10.185)

Topics include probability functions for finite and infinite spaces; conditional probability and independence; discrete and continuous probability distributions for one or more random variables; expectation; moments; binomial, Poisson, and normal distributions; central limit theorem.

10.209 Probability II 4 Q.H.
(Prereq. 10.208)

Selected topics are studied, including introduction to stochastic processes, with emphasis on Poisson processes and Markov chains.

10.210 Introduction to Discrete Structures 4 Q.H.
Elementary concepts of combinatorial mathematics. Graph theory, enumeration algorithms, permutation groups, and coding theory. Application of these structures to various areas of computer science.

10.220 Mathematical Statistics 4 Q.H.
(Prereq. 10.208)

Topics include estimation of parameters, confidence intervals, hypothesis testing, regression, sampling distributions. Introduction to analysis of variance and statistical decision theory.

10.221 Applied Analysis 4 Q.H.
(Prereq. 10.187)

Selected topics are chosen to demonstrate the application of mathematics to interesting physical and biological problems. Methods chosen from ordinary and partial differential equations, calculus of variations, Laplace transforms, singular perturbations, special functions, dimensional analysis, and other techniques of applied mathematics.

10.222 Applied Analysis 4 Q.H.
(Prereq. 10.221)
Continuation of 10.221

10.223 Numerical Analysis 4 Q.H.
(Prereq. Two years of calculus and one course in programming)

This is a computer-oriented introductory course with emphasis on appreciation of the difference between the theoretical existence of a solution and its numerical calculation. Topics covered: systems of linear equations, nonlinear equations, interpolation, and approximation of functions. Students are required to program and analyze problems on a computer.

10.224 Numerical Analysis 4 Q.H.
(Prereq. 10.223)

Continuation of 10.223. Topics include numerical differentiation and integration, solution of ordinary differential equations, and other topics as time permits.

10.226 Functions of a Complex Variable I 4 Q.H.
(Prereq. 10.184 or equiv.)

Topics include algebra and geometry of complex numbers; concepts of limit, continuity, and derivative in the complex domain; holomorphic functions, series, contour integration. Applications.

10.227 Functions of a Complex Variable II 4 Q.H.
(Prereq. 10.226)

Continuation of 10.226. Further topics may include conformal mapping, analytic continuation, Riemann surfaces, the Laplace transform and inverse transform, elliptic functions, applications.

10.230 Linear Programming 4 Q.H.
(Prereq. Nonmath majors; one year of college mathematics)

Introduction to concepts and techniques of linear programming, game theory, stochastic processes. Application to economics, social sciences, and other related fields.

10.232 Multivariate Statistics 4 Q.H.
(Prereq. 10.220)

The course examines methods of classification, estimation, and prediction based on several statistical variables.

10.235 Automata Theory and Formal Languages 4 Q.H.
(Prereq. 06.130 and 06.201 or equiv.)

Topics include finite-state machines and regular expressions, context-free grammars. Parsing of context-free languages. Context-sensitive grammars, push-down stores, stack machines and linear-bounded automata. Turing machines, undecidability, description of computation using list structures, program machines, and programs.

10.236 Artificial Intelligence 4 Q.H.
(Prereq. 06.201 or equiv.)

The course provides analysis of current computer programs dealing with problems such as theorem proving, chess playing, general problem solvers, robotics, symbolic computation, preceptrons, self-reproducing automata, and parallel machines.

10.240 Mathematical Models in the Life Sciences 4 Q.H.
(Prereq. One year of calculus)

The focus of this course is the derivation and solution of mathematical models in biology, psychology, and the social sciences. Topics may include population dynamics, diffusion processes, pollution control systems, neural networks, and mathematical genetics.

10.246 Linear Algebra I 4 Q.H.

(Prereq. 10.187 or permission of instructor)

Topics include vectors and vector spaces, including function spaces, subspaces. Lengths, angles, scalar products; volumes, determinants. Linear independence and dependence, dimension, linear and affine maps, kernel and image. Algorithms: row operations, double triangular form, inversion. Introduction to linear maps. In particular, characteristic polynomials, eigenvalues, and eigenvectors in low dimensions.

Note: Students who have not completed 10.181-10.187 should inform the course instructor of their backgrounds.

10.247 Linear Algebra II 4 Q.H.
(Prereq. 10.246)

The course focuses on detailed study of linear maps. Part I: Symmetric maps and quadratic forms. Isometries and skew-symmetric maps. Decomposition of general linear maps using symmetric maps and isometries. Part II: Polynomials evaluated on linear maps. Generalized eigenspaces. Jordan form. As time permits, an introduction to computational methods with emphasis both on geometry underlying algorithms and on practical advantages and limitations. A survey of related areas in mathematics in which linear ideas play a role is included.

Note: Upper-level students who have not completed the 10.181-10.187 program may take 10.246-10.247. Such students should inform the course instructor regarding their particular backgrounds.

10.250 Analysis I 4 Q.H.

(Prereq. 10.187 or permission of instructor)

The course examines the theoretical foundations of calculus: limits, measure, continuity, and related concepts. Analysis I and II are intended to serve as a bridge between the 10.181-10.187 calculus sequence and the more advanced analysis courses, such as 10.221-2, 10.226, and 10.264-5.

10.251 Analysis II 4 Q.H.

(Prereq. 10.250)

Continuation of 10.250. The course focuses on calculus, applying the concepts introduced in Analysis I.

10.254 Introduction to Groups and Their**Applications 4 Q.H.**

Topics include examples of groups (symmetry groups, permutation groups, matrix groups, cyclic groups) and their subgroups. Finite groups and orders of subgroups. Homomorphisms and normal subgroups. Applications to some of the following, depending on time and interest: geometry, number theory, crystallography, physics, and combinatorics.

10.256 Topics in Rings, Fields, and Number**Theory 4 Q.H.**

Topics include algebraic properties of the in-

tegers and rational, real, and complex numbers. Commutative rings, ideals, integral domains, and other quotient fields. Polynomial rings. Quadratic extension fields. Gaussian integers. Other topics as time permits.

10.257 Optimization and Mathematical Game**Theory 4 Q.H.**

(Prereq. Some linear algebra, e.g., 10.246; or permission of instructor.)

Topics include convex sets in Euclidean n -space, linear and nonlinear programming, zero-sum games, dynamic programming. Students are encouraged to program selected solution methods for a computer.

10.264 Recent Ideas in Geometry 4 Q.H.

(Prereq. 10.251 and 10.247, or permission of instructor)

Topics chosen by the instructor may vary each year. Topological classification of surfaces, theory of critical points and singularities of mappings, topological study of vector fields, knot theory, graph theory, differential geometry of surfaces, algebraic curves, homotopy.

10.265 Recent Ideas in Geometry 4 Q.H.

(Prereq. 10.264)

Continuation of 10.264

10.271 Foundations of Mathematics 4 Q.H.

Topics include development, structure, and use of the number systems; peano postulates for integers; construction of negative numbers and rationals; development of real and complex numbers; introduction to model theory and the existence and use of alternative number structures; hyperintegers; calculus with infinitesimals.

10.272 Foundations of Mathematics 4 Q.H.

Course material includes set theory; rules for set formation; the axiom of choice and its role in mathematics; transfinite cardinal and ordinal numbers and their arithmetic; axiomatizations of set theory.

10.273 History of Mathematics 4 Q.H.

Topics include development of the various branches of mathematics; lives of outstanding mathematicians; growth of mathematical knowledge and its relation to culture.

10.274 Number Theory 4 Q.H.

(Prereq. 10.246 or permission of instructor)

An introduction to the elementary methods of analytic number theory, this course focuses on divisibility, congruences, arithmetical and multiplicative functions, quadratic reciprocity, and equivalent formulations of the prime number theorem.

10.281-10.289 Directed Study 4 Q.H.

(Prereq. Permission of instructor)

Programs of directed study, held one or more quarters, are available for highly motivated students who wish to explore mathematical situations and theories in depth. Directed study can be used as an opportunity to examine

familiar material in fresh ways or to explore new material that is not offered in formal courses. It is hoped that directed study programs will provide students strong in mathematics and the related sciences a chance to develop the art and skill needed to work independently and creatively in mathematics.

Note: Students strong in mathematics are permitted to enroll in graduate courses in mathematics.

10.295, 10.296, 10.297, 10.298 Honors Program
(each) **4 Q.H.**

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

10.407 College Algebra and Trigonometry I
4 Q.H.

Topics include fundamental algebraic operations, complex numbers, radicals and exponents, functions, linear and quadratic equations, irrational equations, inequalities, variation, roots of polynomial equations.

10.408 College Algebra and Trigonometry II
(Prereq. 10.407) **4 Q.H.**

Topics include logarithms; trigonometric functions of angles in degrees and radians, trigonometric identities and equations, right triangles, oblique triangles, complex numbers in trigonometric form, systems of equations, determinants.

10.420 Calculus I **4 Q.H.**
(Prereq. 10.408)

Plane analytic geometry; differentiation of algebraic functions; rate, motion, maximum and minimum problems; derivatives of higher order; curve sketching; basics in functions, limits, and continuity. (Not equivalent to 10.150)

10.421 Calculus A **4 Q.H.**
(Prereq. 10.420)

Topics include applications of derivatives to curve sketching; antidifferentiation; the definite integral, with applications; calculus of non-algebraic functions—logarithmic, exponential, and trigonometric; calculus of inverse trigonometric functions; techniques of integration; indeterminate forms; L'Hospital's rule. (Not equivalent to 10.151)

10.422 Calculus B **4 Q.H.**
(Prereq. 10.420)

Topics include polar coordinates, vectors in a plane, calculus of functions of several variables, partial differentiation, multiple integrals, infinite series, vector analysis, introduction to differential equations. (Not equivalent to 10.152)

10.423 Differential Equations **4 Q.H.**
(Prereq. 10.422)

Topics include ordinary differential equations—standard types of the first order, linear differential equations, especially with constant coefficients; Laplace transforms; series solutions of differential equations; Fourier series and orthogonal functions.

Physics

Courses are listed according to level and degree of specialization and are not in numerical order. General interest courses have no prerequisites and may be used to satisfy College of Arts and Sciences distribution requirements in science. Introductory physics courses are basic first-year physics lecture courses; the corresponding laboratories are listed under introductory physics laboratories. Advanced physics and astronomy courses require one year of introductory physics and may be used to satisfy degree requirements for physics majors. Courses marked with an asterisk * are offered for students in the Lincoln College full-time program; they do not fulfill credit requirements in the College of Arts and Sciences.

General Interest Courses

11.109 Physics in Music **4 Q.H.**

This course discusses the physical principles involved in producing, recording, and reproducing music. Topics include explanations of the operation of various instruments in terms of the basic properties of resonances and waves; physical and psychological response of the ear; the physical basis of the modern (well-tempered) system of tuning; the operation of microphones, amplifiers, loudspeakers, tape recorders, radios, and other devices.

11.180 Introduction to Astronomy I **4 Q.H.**

The first quarter of a two-quarter sequence, this course offers the nonscience student an introduction to modern astronomical ideas. Topics include introduction to the cosmos; tools of the astronomer (atoms, the nature of light and radiation, telescopes, space astronomy); the earth in space; our solar system (origin and future of the solar system, the planets and other bodies, the latest from spacecraft flights, the sun as our bridge to the stars); the question of life in the universe.

11.181 Introduction to Astronomy II 4 Q.H.
(Prereq. 11.180)

Topics include properties of stars: life and death of stars (Hertzsprung Russell Diagram, birth of stars, main sequence, red giants, white dwarfs, supernovae, neutron stars, black holes); our Milky Way galaxy; galaxies; quasars, cosmology (the expanding universe, the big bang, the future of the universe).

93.171 Introduction to Science I 4 Q.H.

93.171 and 93.172 form a two-quarter sequence for nonscience majors that provides an interdisciplinary treatment of the basic ideas of the natural sciences. Concepts such as energy, gravity, and the atom are discussed, followed by a consideration of the ways in which atoms combine to form the substances that comprise matter.

93.172 Introduction to Science II 4 Q.H.
(Prereq. 93.171)

A continuation of 93.171, this part of the course discusses life, its origin from inanimate surroundings, cells, and some of the cellular processes important to living things.

Introductory Physics Courses**11.117 Physics for Science Majors I 4 Q.H.**
(Prereq. 10.181 or equiv. may be taken concurrently)

Topics include mechanics: kinematics, Newton's laws, circular motion, work energy, linear momentum. To take the laboratory for this course, register for 11.147 concurrently.

11.118 Physics for Science Majors II 4 Q.H.
(Prereq. 11.117; 10.182 or equiv. may be taken concurrently)

Topics include rotational motion, angular momentum, harmonic motion, wave motion, sound, heat and thermodynamics, kinetic theory. To take the laboratory for this course, register for 11.148 concurrently.

11.119 Physics for Science Majors III 4 Q.H.
(Prereq. 11.117; 10.183 or equiv. may be taken concurrently)

Topics include electricity and magnetism; circuits; electromagnetic waves; topics in modern physics. To take the laboratory for this course, register for 11.149 concurrently.

11.126 Physics Review for Engineering Students 6 Q.H.
(Prereq. One year of college physics; knowledge of elementary calculus)

This course offers an intensive review for students who have had previous college physics courses not equivalent to the engineering sequence 11.203-11.206. Topics include fundamentals of mechanics, electricity, and magnetism with emphasis on the use of vectors and elementary calculus. Passing this course is equivalent to passing 11.205 and 11.206.

11.136 Basic Physics I 4 Q.H.

Topics include the physical properties of gases and condensed matter, force and pressure, hydrostatics, ideal and real gases, condensation and evaporation, surface tension, osmosis and fluid flow. Laboratory is an integral part of the course.

11.137 Basic Physics II 4 Q.H.
(Prereq. 11.136)

A continuation of 11.136, this course focuses on electric circuits and current flow, a-c circuits and measurements with the oscilloscope, atomic structure and spectroscopy, spectrophotometry, nuclear physics.

11.171 Physics for the Life Sciences I 4 Q.H.

Topics include vector addition of force, principles of statics; Newton's second law, kinetic and potential energy; pressure static properties of fluids, fluid flow. To take the laboratory for this course, register for 11.173 concurrently.

11.172 Physics for the Life Sciences II 4 Q.H.
(Prereq. 11.171)

Topics include wave motion, sound, light, optics, static electricity, d.c. circuits, magnetism. To take the laboratory for this course, register for 11.174 concurrently.

11.175 Physics for the Life Sciences III 4 Q.H.
(Prereq. 11.171)

Topics include temperature, gas laws, properties of liquids (surface tension and osmotic pressure), properties of solids, thermal physics, Coulomb's law, atomic and nuclear physics.

11.203 Physics for Engineering Students I 4 Q.H.
(Prereq. 10.150 or equiv., may be taken concurrently)

The first quarter of a four-quarter sequence intended primarily for engineering students, this course covers mechanics, kinematics, dynamics, Newton's laws, work, energy, linear momentum, collisions.

11.204 Physics for Engineering Students II 4 Q.H.
(Prereq. 11.203; 10.151 or equiv. may be taken concurrently)

A continuation of 11.203, this course focuses on rotational dynamics, angular momentum, statics, harmonic motion, wave motion, sound, heat, and the First Law of Thermodynamics.

11.205 Physics for Engineering Students III 4 Q.H.
(Prereq. 11.204; 10.152 or equiv. may be taken concurrently)

A continuation of 11.204, the focus of this course is on electricity, electrostatics, Gauss's law, electric fields, potential, capacitance, resistance, current Ohm's law, circuits, the magnetic field.

11.206 Physics for Engineering Students IV 4 Q.H.
(Prereq. 11.205; 10.153 or equiv. may be taken concurrently)

A continuation of 11.205, this course covers magnetism: Ampere's law, induction, inductance, magnetic energy; electromagnetic oscillations.

tions, electromagnetic waves, polarization; ray optics: reflection, refraction, mirrors and lenses; wave optics: interference, diffraction, gratings.

11.417 Physics I* **4 Q.H.**
(Prereq. 10.407, may be taken concurrently)

Topics include kinematics and dynamics of particle motion, Newton's laws, projectile and circular motion, conservation laws for momentum and energy, rotational motion; simple harmonic motion.

11.418 Physics II* **4 Q.H.**
(Prereq. 11.417; 10.408, may be taken concurrently)

Topics include wave motion, intensity, interference phenomena, Doppler effect, vibrating systems, temperature, heat, change of state, heat transfer, kinetic theory of gases, general gas laws, thermodynamics.

11.419 Physics III* **4 Q.H.**
(Prereq. 11.418)

Topics include electrostatics, magnetism, magnetic induction, induced currents, direct- and alternating-current circuits, properties of light, reflection, refraction, dispersion, optical systems, diffraction, polarization.

11.420 Physics IV* **4 Q.H.**
(Prereq. 11.419)

Course focuses on static electric and magnetic fields; experimental basis for Maxwell's equations; electromagnetic waves.

Introductory Physics Laboratories

11.110 Physics Laboratory for Engineering Students I **1 Q.H.**
(Prereq. 11.205)

This course is the first of a two-quarter laboratory sequence in which the student performs experiments from various fields of physics.

11.111 Physics Laboratory for Engineering Students II **1 Q.H.**
(Prereq. 11.110 and 11.206)

This course is a continuation of 11.110

11.147 Physics Laboratory for Science Majors I **1 Q.H.**
(Prereq. 11.117 concurrently)

Focus is on laboratory experiments related to topics covered in 11.117.

11.148 Physics Laboratory for Science Majors II **1 Q.H.**
(Prereq. 11.147; 11.118 concurrently)

Focus is on laboratory experiments related to topics covered in 11.118.

11.149 Physics Laboratory for Science Majors III **1 Q.H.**
(Prereq. 11.147; 11.119 concurrently)

Focus is on laboratory experiments related to topics covered in 11.119.

11.173 Physics Laboratory for the Life Sciences I **1 Q.H.**
(Prereq. 11.171 concurrently)

This course is the first quarter of a two-quarter laboratory sequence accompanying 11.171 and 11.172.

11.174 Physics Laboratory for the Life Sciences II **1 Q.H.**
(Prereq. 11.173; 11.172 or 11.175 concurrently)

This course is a continuation of 11.173.

11.473 Physics Laboratory I* **2 Q.H.**
(Prereq. 11.417; 11.418 concurrently)

This course covers experiments from various physics topics that have been covered in 11.417 and, concurrently, in 11.418.

11.474 Physics Laboratory II* **2 Q.H.**
(Prereq. 11.473, 11.418; 11.419 concurrently)

This course is a continuation of 11.473, with experiments from topics in 11.418 and 11.419.

Advanced Physics and Astronomy Courses

11.127 Intermediate Mechanics **4 Q.H.**
(Prereq. 11.118 and 11.119; 10.184 concurrently)

Topics include classical mechanics in two and three dimensions; a review of Newton's laws; special emphasis on conservation theorems for energy, momentum and angular momentum; harmonic and wave motion.

11.128 Electric and Magnetic Fields **4 Q.H.**
(Prereq. 11.127; 10.185 concurrently)

This course focuses on the basic concepts of electric and magnetic fields, including electric and magnetic fields in free space and materials; Maxwell's equations in integral form.

11.182 Introduction to Astrophysics and Cosmology **4 Q.H.**
(Prereq. Three quarters of elementary physics)

The purpose of this course is to introduce the student to current ideas in astrophysics and cosmology, with emphasis on recent advances in this field. Topics include tools of the astronomer (gamma- X-, UV-, optical-, infrared-, radio-telescopes, spectroscopes, spacecrafts, etc.); solar system; stellar properties (site luminosity); stellar spectra; Hertzsprung-Russell diagram; stellar energy sources (gravitational, nuclear); evolution of stars (birth, main sequence, red giants, white dwarfs, planetary nebulae, supernovae, neutron stars and pulsars, black holes and gravitational collapse); methods of interstellar and intergalactic distance measurement; our Milky Way Galaxy; extragalactic objects (galaxies, clusters of galaxies, radio galaxies, quasars); cosmology (Olber's paradox; recession of galaxies, big bang theory, cosmic background radiation, formation of galaxies, the future of the universe).

11.200 Classical Mechanics 4 Q.H.
(Prereq. 11.127 and 10.186)

This course covers advanced topics in classical mechanics, including vector kinematics; harmonic oscillator and resonance; generalized coordinates; Lagrange's equations; central forces and the Kepler problem; rigid body motion.

11.208 Mathematical Physics 4 Q.H.
(Prereq. 11.119 and 10.185; 10.187 concurrently)

Topics include review of linear algebra and vector calculus; special functions and partial differential equations of physics; potential theory; functions of a complex variable.

11.21A (B, C, etc.) Independent Study 1 Q.H.

11.22A (B, C, etc.) Independent Study 2 Q.H.

11.23A (B, C, etc.) Independent Study 3 Q.H.

11.24A (B, C, etc.) Independent Study 4 Q.H.

11.211 Electricity and Magnetism I 4 Q.H.
(Prereq. 11.128; 11.208 or equiv.)

The first of a two-quarter sequence in electromagnetic theory, this course covers Maxwell's equations and their experimental basis; electrostatics and magnetostatics; the electromagnetic field in empty space; electromagnetic waves.

11.212 Electricity and Magnetism II 4 Q.H.
(Prereq. 11.211 or equiv.)

A continuation of 11.211, this course focuses on energy and momentum in the electromagnetic field; electrodynamics; the interaction of matter and the field; radiation.

11.220 Thermodynamics and Kinetic Theory 4 Q.H.
(Prereq. 11.119 or 11.206; 10.185)

Topics include First and Second Laws of Thermodynamics; entropy and equilibrium; thermodynamic potentials; elementary kinetic theory; statistical mechanics and the statistical interpretation of entropy.

11.221 Wave Motion and Optics 4 Q.H.
(Prereq. 11.128)

Topics include harmonic and coupled oscillators, wave equation; geometrical and physical optics; interference, diffraction, optics of solids, amplification of light; lasers.

11.230 Modern Physics 4 Q.H.
(Prereq. 11.119, 11.206, or equiv.)

The course provides a review of experiments demonstrating the atomic nature of matter, the properties of the electron, the nuclear atom, the wave-particle duality, spin, and the properties of elementary particles. The course discusses, mostly on a phenomenological level, such subjects as atomic and nuclear structure, properties of the solid state, and elementary particles.

11.231 Physics Review for Re-entry Students 4 Q.H.
(Prereq. Two years of physics)

This is a review course on the material covered by 11.200, 11.220, and 11.221. Topics include vector kinematics; generalized coordinates; Lagrange equations; harmonic and coupled oscillators, wave equation; physical optics, interference, diffraction, optics of solids, lasers; entropy and equilibrium, thermodynamic potentials; elementary kinetic theory; statistical mechanics.

11.240 Quantum Mechanics I 4 Q.H.
(Prereq. 11.230 or 12.170; 11.208 or equiv.)

The first of a two-quarter sequence in quantum mechanics, this course focuses on observations of macroscopic and microscopic bodies, the uncertainty principle, wave-particle duality, probability amplitudes, Schrodinger wave theory, one-dimensional problems.

11.241 Quantum Mechanics II 4 Q.H.
(Prereq. 11.240)

A continuation of 11.240, this course covers discrete and continuous states, Schrodinger equation in three dimensions, angular momentum, general theory of quantum mechanics, applications.

11.246 Electronics for Scientists I 4 Q.H.

11.246 and 11.247 form a two-quarter sequence covering electronic techniques for experimental research in many different fields of science. Topics include principles of semiconductor devices; analog techniques (amplification, feedback, integration); digital techniques (counting, multiplexing, logic); design of electronic sub-systems (analog-to-digital converters, phase-sensitive detectors, data-logging systems); understanding specifications of commercial electronic equipment. Lab examples make use of up-to-date integrated and discrete devices such as are currently used in the electronic industry.

11.247 Electronics for Scientists II 4 Q.H.
(Prereq. 11.246)

This course is a continuation of 11.246.

11.260 Wave Laboratory 4 Q.H.
(Prereq. 11.128 or 11.206)

This course offers a general treatment of the problems of mechanical and electromagnetic radiation as wave phenomena. Topics include the differential wave equation and its application to selected topics; interference and diffraction theory from the standpoint of the Huygens-Fresnel and Kirchhoff formulations; selected experiments in acoustics, optics, and microwaves to illustrate these problems.

11.272 Modern Physics Laboratory 4 Q.H.
(Prereq. 11.230 or permission of instructor)

This course presents experiments investigating the atomic nature of matter, the properties of the electron, and special relativity. The work involves vacuum-system techniques and machine-shop practice.

11.273 Advanced Physics Laboratory 4 Q.H.
(Prereq. 11.246 and 11.247)

This course presents special projects in modern experimental physics; including electronic instrumentation used in measuring physical quantities and use of microprocessors.

11.282 Introduction to Solid State Physics 4 Q.H.
(Prereq. 11.230 or 12.170; 11.220 or equiv.)

This course offers a semi-classical treatment of the thermal, magnetic, and electrical properties of crystalline solids. Topics include X-ray diffraction and the reciprocal lattice, elasticity and lattice vibrations, specific heat, properties of insulators, magnetism in insulators and metals, introduction to the band theory of metals.

11.283 Plasma Physics 4 Q.H.
(Prereq. 11.206 or 11.128 or equiv.)

The aim of this course is to introduce the student to the study of plasma physics. The course will develop the fundamentals of plasma physics in a manner that does not require an extensive background in advanced physics.

11.285 Introduction to Nuclear Physics 4 Q.H.
(Prereq. 11.230)

Topics include nuclear structure, nuclear masses, radioactivity, nuclear radiation, interaction of radiation and matter, detectors, fission, nuclear forces; elementary particles.

11.295, 11.296, 11.298 Junior-Senior Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Project on page 1.

Chemistry

12.106 General Chemistry 5 Q.H.*

This course, designed for nonchemistry majors, focuses on basic concepts and definitions: the mole concept and chemical stoichiometry, states of matter, solutions, periodicity of elements, atomic structure, chemical bonding and reactions.

12.107 General Chemistry 5 Q.H.*
(Prereq. 12.106)

This course, for students who *will not* be taking further chemistry, covers chemical equilibria; acids, bases, and buffers; an introduction to organic and biochemistry; elementary thermodynamics; voltaic cells; and nuclear chemistry.

12.111 General Chemistry 4 Q.H.*

The course examines basic principles of inorganic and organic chemistry and how they relate to human body processes.

12.112 General Chemistry 4 Q.H.*
(Prereq. 12.101)

The course focuses on biochemistry principles.

12.114 General Chemistry 4 Q.H.

Primarily for engineering students. Introduction to the principles of chemistry, focusing upon the states and structure of matter and chemical stoichiometry.

12.115 General Chemistry 4 Q.H.
(Prereq. 12.114)

Primarily for engineering students, the course offers an introduction to the principles of chemistry, focusing upon chemical equilibria, the nature of some common materials, and energy considerations in chemical and nuclear transformations.

12.118 General Chemistry Laboratory 1 Q.H.*
Optional laboratory for 12.115, General Chemistry, for engineering students. Experiments pertaining to lecture material.**12.119 General Chemistry 5 Q.H.***
(Prereq. 12.106)

For nonchemistry majors who will be taking 12.144, Organic Chemistry. Subjects covered include chemical kinetics and equilibria; acids and bases; elementary thermodynamics and kinetics; electrolysis and electrochemistry; chemistry of the representative elements; and nuclear chemistry.

12.124 General Chemistry 4 Q.H.

Similar to 12.127, but without laboratory. (Not available to majors from chemistry, biology, or pharmacy/allied health sciences.)

12.125 General Chemistry 4 Q.H.
(Prereq. 12.124)

Similar to 12.128, but without laboratory. (Not available to majors from chemistry, biology, or pharmacy/allied health sciences.)

12.127 General Chemistry 5 Q.H.*

For chemistry majors and selected students in other majors, such as biology, physics, etc. Course focuses on basic concepts and definitions, moles, gas laws, stoichiometry, atomic structure, periodic properties, chemical bonding.

12.128 General Chemistry 5 Q.H.*
(Prereq. 12.127 or 12.124)

Topics include solutions, chemical kinetics, chemical equilibrium, chemical thermodynamics, electrochemistry, chemistry of the representative elements.

*Lab fee required.

- 12.129 The Chemical Elements** 5 Q.H.*
(Prereq. 12.115, 12.119, 12.128, or equiv.)
For chemistry majors and selected students in other majors. The principal concepts of chemistry (thermodynamics, chemical bonding, kinetics) are applied to a systematic survey of the characteristic behavior of the chemical elements and their compounds.
- 12.134 Composition of the Oceans** 4 Q.H.
Seawater, its nonliving components, and the changes they undergo during natural and technological activities. Principles illustrated include the structures of substances and solutions, dynamic equilibrium, nuclear and ionic reactions, and the dynamics of pollution, as they relate to the oceans. The course presupposes an exposure to chemistry in secondary school. The course is not recommended for students who have completed a college-level chemistry course and is not for students majoring in any science.
- 12.144 Organic Chemistry** 5 Q.H.*
(Prereq. 12.119, 12.128, or equiv.)
For nonchemistry majors. Course covers nomenclature, preparation, properties, and reactions of common organic compounds.
- 12.145 Organic Chemistry** 5 Q.H.*
(Prereq. 12.144)
Continuation of 12.144.
- 12.147 Organic Chemistry** 4 Q.H.*
(Prereq. 12.115)
For chemical engineering majors. Topics include compounds: preparation, properties, and reactions of the more common classes of open-chain compounds; electronic interpretation of structures and reactions; petrochemicals; synthetic resins; carbohydrates; fats; and proteins.
- 12.148 Organic Chemistry** 4 Q.H.*
(Prereq. 12.147)
Topics include aromatic compounds: preparation, properties, and reactions of the more common classes of aromatic compounds; electronic interpretation of structures and reactions of aromatic compounds; dyes, commercial solvents, and important industrial products. A brief introduction to alicyclic and heterocyclic compounds.
- 12.153 Organic Chemistry** 3 Q.H.
(Prereq. 12.129)
For chemistry majors and selected students in other majors. Course covers synthesis and properties of aliphatic and aromatic hydrocarbons and their functional derivatives; correlation between the structure of organic compounds and their physical and chemical properties; and electronic interpretation of organic reactions.
- 12.154 Organic Chemistry** 5 Q.H.*
(Prereq. 12.153)
Continuation of 12.153.
- 12.155 Organic Chemistry** 5 Q.H.*
(Prereq. 12.154)
Continuation of 12.154.
- 12.161 Physical Chemistry** 4 Q.H.*
(Prereq. 10.153 or 10.184, 11.119 or 11.205, or equiv.)
Chemical thermodynamics.
- 12.162 Physical Chemistry** 4 Q.H.*
(Prereq. 12.161)
Topics include phase equilibria, solutions, kinetic theory of gases, chemical kinetics.
- 12.166 Physical Chemistry** 3 Q.H.
(Prereq. 10.153 or 10.184, 11.119 or 11.205, or equiv.)
Similar to 12.161, but without laboratory.
- 12.168 Physical Chemistry** 4 Q.H.*
(Prereq. 12.162 or 12.169)
Course covers quantum chemistry, particles and waves, Schrodinger wave mechanics, the chemical bond.
- 12.169 Physical Chemistry** 3 Q.H.
(Prereq. 12.161 or 12.166)
Similar to 12.168, but without laboratory.
- 12.170 Physical Chemistry** 3 Q.H.
(Prereq. 12.162 or 12.169)
Similar to 12.168, but without laboratory.
- 12.171 Analytical Chemistry** 4 Q.H.*
(Prereq. 12.119 or equiv.)
For nonchemistry majors. The course encompasses the theories, principles, and applications of volumetric, gravimetric, and instrumental methods of analysis.
- 12.172 Analytical Chemistry** 5 Q.H.*
(Prereq. 12.119, 12.128, or equiv.)
For chemistry majors and selected students in other majors. Course covers principles, applications, and methods of analytical chemistry. Selected topics in data interpretation and chemical measurement are included.
- 12.179 Instrumental Analysis** 5 Q.H.*
(Prereq. 12.162 and 12.172)
Course focuses on principles, methods, and applications of selected topics in electrometric, chromatographic, and opticomeric chemical analysis.
- 12.180 Chemical Oceanography** 4 Q.H.*
(Prereq. 12.115, 12.119, 12.128, or equiv.)
The course examines chemistry of seawater and sea sediments; methods and techniques of chemical oceanography.
- 12.181 Instrumental Analysis** 3 Q.H.
(Prereq. 12.171, 12.172, equiv.)
For nonchemistry majors only. Similar to 12.179, but without laboratory.

*Lab fee required.

12.213 Inorganic Chemistry 4 Q.H.

(Prereq. 12.168)

Topics include atomic properties of free atoms and ions. Ionic bonding and the structure of the solid state. The Madelung calculation; the Born-Haber and other thermodynamic cycles. Valence-bond, molecular, orbital, and crystal field theories of bonding. Stereochemistry of compounds of representative elements. Electron-deficient compounds. Spectral and magnetic properties of transition metal compounds.

12.221 Polymer Chemistry I 3 Q.H.

(Prereq. 12.155 or equiv.)

The course provides an introduction to polymers. Major emphasis on synthesis. Step-reaction, chain-reaction, and ring-opening polymerizations. Copolymerization. Three-dimensional polymers and cross-linking. Corresponds to graduate course 12.901.

12.222 Polymer Chemistry II 3 Q.H.

(Prereq. 12.162 or equiv.)

Topics include physical chemistry of polymers in solution and bulk. Molecular characterization. Mechanical and physical properties in the glassy, rubbery, viscous, and semicrystalline states. Corresponds to graduate course 12.902.

12.223 Polymer Chemistry III 3 Q.H.

(Prereq. 12.221 and 12.222)

Topics include industrial practice, polymer processing, fibers, elastomers, coatings, adhesives, reinforced plastics. Relation of polymer structure to usage. Corresponds to graduate course 12.903.

12.252 Advanced Organic Chemistry I 3 Q.H.

(Prereq. 12.155 or 12.145)

Course focuses on organic structure and reactions. Corresponds to graduate course 12.861.

12.253 Identification of Organic Compounds

(Prereq. 12.145 or 12.155)

3 Q.H.*

The course examines qualitative analysis of organic compounds and mixtures, using physical, chemical, and instrumental methods.

12.254 Advanced Organic Chemistry II 3 Q.H.

(Prereq. 12.252)

The course examines organic structure and reactions. Corresponds to graduate course 12.862.

12.255 Advanced Organic Chemistry III 3 Q.H.

(Prereq. 12.254)

The course focuses on organic structure and properties. Corresponds to graduate course 12.863.

12.256 Spectrophotometric Identification of Organic Compounds 3 Q.H.

(Prereq. 12.155 or equiv.)

The course examines spectrophotometric identification of organic compounds. Corresponds to graduate course 12.866.

Corresponds to graduate course 12.866.

12.257 Advanced Analytical Chemistry III

(Prereq. 12.179 or equiv.)

3 Q.H.

The course examines analytical separations. Corresponds to graduate course 12.821.

12.258 Advanced Analytical Chemistry II 3 Q.H.

(Prereq. 12.179)

Electroanalytical. Corresponds to graduate course 12.822.

12.259 Advanced Analytical Chemistry I 3 Q.H.

(Prereq. 12.179 or equiv.)

The course covers optical methods of analysis. Corresponds to graduate course 12.823.

12.262 Advanced Physical Chemistry I 3 Q.H.

(Prereq. 12.168)

The course examines chemical thermodynamics. Corresponds to graduate course 12.881.

12.263 Advanced Physical Chemistry II 3 Q.H.

(Prereq. 12.168)

The course focuses on atomic and molecular structure. Corresponds to graduate course 12.885.

12.264 Advanced Physical Chemistry III 3 Q.H.

(Prereq. 12.168)

The course focuses on chemical kinetics. Corresponds to graduate course 12.893.

12.266 Advanced Inorganic Chemistry I 3 Q.H.

(Prereq. 12.213)

The course covers application of quantum chemistry to inorganic systems. Corresponds to graduate course 12.841.

12.267 Advanced Inorganic Chemistry II 3 Q.H.

(Prereq. 12.266)

Continuation of 12.266. Corresponds to graduate course 12.842.

12.268 Advanced Inorganic Chemistry III 3 Q.H.

(Prereq. 12.267)

Chemistry of the solid state. Corresponds to graduate course 12.843.

12.274, 12.275, 12.276, 12.277, 12.278, 12.279**Undergraduate Research (each) 4 Q.H.**

For chemistry majors. The course offers original experimental work under the direction of a staff member. Participation may begin in the middle year and will normally continue through the senior year. A minimum of a two-quarter commitment is required for participation. Approval of the administering committee is required.

12.284 Advanced Chemical Synthesis 3 Q.H.*

Special projects in the synthesis of organic and/or inorganic compounds.

12.286 Advanced Chemical Measurements

(Prereq. 12.168 and 12.179)

3 Q.H.*

Laboratory problems in analytical and/or physical chemistry are examined.

*Lab fee required.

12.288 Special Topics
(Prereq. 12.168)**4 Q.H.****12.295, 12.296, 12.297, 12.298 Junior-Senior Honors Program**
(each) **4 Q.H.**
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.**Earth Sciences****16.109 Environmental Geology****4 Q.H.**

The course discusses how geologic processes acting at the earth's surface interact with the human environment. Topics include river and ocean flooding, coastal erosion, landslides, land-use planning, and waste disposal.

16.110 Geologic Hazards and Resources**4 Q.H.**

The course discusses how geologic processes originating deep inside the earth interact with the human environment. Topics include global crustal movements, volcanic and earthquake hazards, mineral resources, coal and oil, geothermal energy, resource management, and disposal of radioactive wastes.

16.130 Marine Resources**4 Q.H.**

The course provides a qualitative and quantitative survey of renewable and nonrenewable resources from the sea. Aspects covered include offshore oil and gas utilization, marine minerals, and tidal power; coastal zone recreational resources, including polluted beaches and artificial fishing reefs.

16.131 Physical Oceanography**4 Q.H.**

The course provides a description of the physical properties and composition of sea water, waves, tides, and ocean currents. The course discusses how these properties are measured by oceanographers and how they influence the earth's environment and climate.

16.132 Biological Oceanography**4 Q.H.†**

Topics include the productivity of animal and plant life in the various zones of the ocean; the growing economic importance of the oceans as a source of food for the expanding world population.

16.139 Geological Oceanography**4 Q.H.**

In this course the form of the ocean basins and their margins is related to the major processes forming them. Emphasis is placed on local landforms, including New England beaches, spits, barrier islands, and the continental shelf.

16.161 Observational Astronomy**4 Q.H.**

The course offers an introduction to the night sky by confrontation technique. Identification of the permanency of the circumpolar region. A systematic analysis of the available hour-angle constellations. Relevant supportive data provided for each nightly viewing. Continuous

records of the characteristic behavior of the sun, moon, and available naked-eye planets. Periodic out-of-doors viewing sessions with binoculars and telescopes (amateur quality), especially on occasions of special phenomena, i.e., meteor showers and comets. Explanatory instructional information during open portions of class periods by lecture, lecture-demonstration, or planetary sessions.

16.165 Planetary Astronomy**4 Q.H.**

This course focuses on astronomy of the solar system. Topics include description of the planets and other objects with discussion of how our understanding has evolved from the days of naked-eye observation to the present era of interplanetary probes.

16.166 Observational Astronomy**5 Q.H.**

An introduction to systematic observation of the night sky, this course emphasizes observation and description of the patterns and motions of celestial bodies as seen with the unaided eye. Nightly viewing sessions required; supplemented by training sessions in the planetarium.

16.192 North America and the Ice Age**4 Q.H.**

This course focuses on description and history of ice-sheets that have advanced and retreated across the northern U.S.A. and Canada during the last three million years. Topics include evidence of past climatic change and predictions of future change, fluctuating sea levels, and the impact of these changes on man and the environment.

16.201 Physical Geology**4 Q.H.**

The course offers a systematic study of the materials comprising the earth. Topics emphasized include the processes by which rock is formed, transported, altered, and destroyed, as well as the nature and development of landscape.

16.202 Historical Geology**4 Q.H.**

The physical and biological history of the earth is traced through geologic time. Major topics are the origin and evolution of life, mountain building, and continental drift.

16.203 Physical Geology Laboratory**1 Q.H.**

(Prereq. 16.201; may be taken concurrently)
Optional laboratory for 16.201, Physical Geology. Laboratory exercises pertain to mineral and rock identification and topographic and geologic map interpretation. Required for geology majors.

†Including lab fee.

16.204 Historical Geology Laboratory 1 Q.H.

(Prereq. 16.202; may be taken concurrently)

Course offers a study of fossil representatives of major invertebrate phyla, application of fossils to studies of rock sequences, interpretation of geologic history from geologic maps.

16.206 Rock Identification Laboratory 1 Q.H.

(Prereq. 16.215; may be taken concurrently)

The course provides self-paced laboratory exercises in the identification and classification of common rocks.

16.214 Geochemistry 4 Q.H.

(Prereq. One year of chemistry)

The course offers an evaluation of chemical processes important in the various geologic environments and their effects on the development of the lithosphere.

16.215 Descriptive Mineralogy 5 Q.H.

(Prereq. Two quarters of chemistry)

The course provides a study of mineralogy, including crystallography and physical, chemical, and descriptive mineralogy of the common rock-forming minerals. (Formerly 16.211)

16.217 Optical Crystallography 5 Q.H.

(Prereq. 16.215)

The theory and the practical methods of optical crystallography are studied, including the basic techniques for determining the optical constants of crystals using the polarizing microscope and immersion media. (Formerly 16.212)

16.218 Petrography 5 Q.H.

(Prereq. 16.217)

Topics include description and identification of rocks and rock-forming minerals using thin-sections and the petrographic microscope; discussion of textural and mineralogic relationships. (Formerly 16.213)

16.219 Igneous and Metamorphic Petrology(Prereq. 16.218) **5 Q.H.**

The course covers the origin and distribution of igneous and metamorphic rocks as interpreted from their chemistry, mineralogy, and field relationships. Laboratory includes field and petrographic analysis of rock suites. (Formerly 16.216)

16.225 Sedimentation and Sedimentary**Environments 5 Q.H.**

(Prereq. 16.202)

The course offers a description of the physical processes of sedimentation and their role in the interpretation of modern and ancient sedimentary environments. Laboratory concentrates on the interpretation and description of the physical and textural properties of sediments and sedimentary rocks.

16.226 Sedimentary Petrology 5 Q.H.

(Prereq. 16.217)

Topics include origin, classification, and petrography of the major groups of sedimentary rocks. Discussion of the environments of deposition of

the nonclastic rocks. Laboratory concentrates on thin-section study of sedimentary rocks. (Formerly 16.222)

16.227 Stratigraphy(Prereq. 16.202) **5 Q.H.**

Course offers study of paleoenvironments and sedimentary-basin analysis based on sedimentary structures, stratigraphic sequences, and fossils. Emphasis is on use of geologic sections, drill-cores, and well-logs. Laboratory interpretation of sedimentary rock suites, maps, and sections. (Formerly 16.221)

16.231 Glacial and Pleistocene Geology 4 Q.H.

(Prereq. 16.202)

The course covers the processes of ice movement and the characteristics and distribution of erosional and depositional structures associated with past and present glaciers; introduction to Pleistocene chronology and correlations.

16.232 Geomorphology(Prereq. 16.201) **4 Q.H.**

The course focuses on the origin and evolution of landscape features by processes operating at or near the earth's surface.

16.233 Coastal Processes(Prereq. 16.201) **4 Q.H.**

The course examines the effect of coastal marine processes and the resultant coastal responses. Topics include the dynamics of waves and currents and the associated erosion, transportation, and deposition of sediment forming beaches, barrier islands, and cliffed structures.

16.235 Landform Interpretation(Prereq. 16.201) **4 Q.H.**

The course focuses on the origin and evolution of landscapes, which may be interpreted on the basis of the size, shape, orientation, composition, and distribution of topographic features. Particular attention is given to the effects of different climates on landscape evolution. The use of topographic maps, geologic maps, and stereo-aerial photographs is emphasized.

16.237 Marine Geology(Prereq. 16.201) **4 Q.H.**

The balance between major sedimentary and tectonic forces in ocean basins and margins is compared to resulting ocean form. Topics include origin of continental shelves, shelf sedimentation and transport, deep-sea processes and sediments. Resource development of OCS oil, sand and gravel, and manganese nodules is evaluated.

16.240 Structural Geology(Prereq. 16.201 and 16.203) **5 Q.H.**

Description and origin of large- and small-scale rock structures with emphasis on interpretation of the mechanics of deformation. Field and laboratory analyses of structural problems using maps, models, and rock specimens. (Formerly 16.241)

16.242 Geophysics**4 Q.H.**

(Prereq. 11.117)

This course offers a study of basic techniques of reflection and refraction seismology, gravity, aeromagnetic, and heat-flow techniques and the information they provide on the structure, composition, and dynamics of the earth's interior. Emphasis is placed on the application of these techniques to the search for economic minerals in the earth's crust.

16.245 Economic Geology**4 Q.H.**

(Prereq. Dept. approval)

The course focuses on the genesis, associations, and occurrence of the major ore minerals, illustrated by studies of selected ore bodies of various types throughout the world.

16.246 Field Geology**4 Q.H.**

(Prereq. 16.201)

The course focuses on field techniques as a working guide for the approach, pursuit, and solution of geologic problems. Among the techniques considered are geologic map construction, stratigraphic section measurement, and field rock description. The laboratory consists of field research at a quarry, roadcut, or other geologic exposure.

16.261 Advanced General Geology**4 Q.H.**

(Prereq. 16.201 and 16.202)

The course offers an introduction to new and advanced concepts, theories, and hypotheses in geology. Students participate actively in discussions, research papers, and individual projects. Topics may include continental drift, sea-floor spreading, uniformitarianism, penplanation, evolution, origin of magma, and origin and geologic history of the moon.

16.252 Invertebrate Paleontology**5 Q.H.**

(Prereq. 16.202)

Survey of the major invertebrate phyla preserved

in the fossil record. Micro- and macro-evolutionary principles are discussed with consideration of adaptive and functional morphology and the role of paleoenvironments. Laboratory involves description and classification of fossil invertebrates.

(Formerly 16.251)

16.271 Geology Seminar**4 Q.H.**

(Prereq. Major in geology or senior status)

The course offers in-depth study, on an individual or small-group basis, of a selected geologic topic. Both oral and written presentations are required.

16.287, 16.288 Undergraduate**Research****(each) 4 Q.H.**

The course offers independent research on a selected topic under the direct supervision of a faculty member. Open only to juniors and seniors majoring in geology, with the recommendation of the supervising faculty member and of the department.

16.290, 16.291 Directed Study**(each) 4 Q.H.**

The course offers independent study of a specific topic not normally contained in the regular course offerings, but within the area of competence of a faculty member. Open to all students with the recommendation of a faculty member and departmental approval.

16.292, 16.293 Special Studies**(each) 1 Q.H.**

The course offers an independent study of a specific topic. Open to all students with the recommendation of a faculty member and departmental approval.

16.295, 16.296, 16.297, 16.298 Junior-Senior**Honors Program****(each) 4 Q.H.**

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Biology

For specific information about terms during which courses are offered, students should inquire at the main office of the Biology Department, 403 Richards Hall. This is especially the case for students wishing to carry a minor in biology, since some courses acceptable only for a minor do not appear in the quarterly Elective Course Selection Booklets. Students should note that courses are presented by category and are not listed in a single numerical sequence.

The following courses are primarily for students with little or no background in college science and mathematics. These courses are not open to biology majors.

18.107 Marine Biology**4 Q.H.**

(Not open to biology majors)

The course provides an introduction to marine life with an emphasis on that of New England shores, and includes concepts of life cycles, adaptation of organisms, productivity, distur-

bance effects due to pollution and/or man and how they interrelate.

18.114 Human Anatomy I and Physiology I

(Not open to biology majors)

5 Q.H.*

The course focuses on cellular and tissue structure and function, followed by anatomical terminology. Topics include histology, anatomy, and physiology of bones, muscles, blood, and nervous systems. The laboratory includes a

* Lab fee required.

study of human bones, cat dissection, and related histology.

18.115 Human Anatomy II and Physiology II

(Not open to biology majors) **5 Q.H.***

The course covers anatomy and physiology of the respiratory, digestive, urogenital, and circulatory systems; physiology of endocrine system; a brief exploration of the anatomy and physiology of eye and ear. The laboratory includes studies of muscle and nerve physiology, blood physiology and histology, and physiology of respiration.

18.116 The Human Organism

(Not open to biology majors) **4 Q.H.***

This course, designed for nonscience majors, provides an introduction to the structure and function of the human body. Emphasis is on the principles of biological and physical science as they relate to life processes in health and disease. Laboratory experiments explore the workings of the students' own biological systems rather than those of other animals.

18.118 Organic Evolution

(Not open to biology majors) **4 Q.H.**

The course focuses on the major features of organic evolution, with emphasis on vertebrate evolution, genetics, and physical influences.

18.119 Environment and Man

(Not open to biology majors) **4 Q.H.**

The course offers an ecological analysis of man's interrelationship with other organisms. The necessary foundation of biological principles is presented.

The following courses are primarily for students majoring in science- or health-related professions or other majors (non-biology) with equivalent background in college science and mathematics. These courses are not open to biology majors.

18.106 Ecological Principles

(Prereq. Non-biology science majors or engineering majors) **4 Q.H.**

Identical to 18.134, but without lab. Not open to biology majors.

18.120 Basic Microbiology

(Prereq. 18.141, or permission of instructor; not open to biology majors) **4 Q.H.**

Microbial life, emphasizing morphological characteristics, physiological activities, and disease production. Laboratory.

18.121 Introductory Microbiology

(Not open to biology majors) **3 Q.H.**

Similar to 18.120, but without laboratory.

18.123 Biology of Human Reproduction

(Not open to biology majors) **4 Q.H.**

The course covers structure and function of male and female reproductive systems; factors affecting sexual development, fertility, and

reproductive behavior in the human species; physiology of coitus, fertilization, pregnancy, birth, and lactation; methods of controlling fertility.

18.141 Basic Animal Biology I

(Not open to biology majors) **4 Q.H.***

The course covers principles of biology; universal properties and processes of living organisms as exemplified by the cell and its activities; inheritance evolution; and environmental relationships. Laboratory.

18.142 Basic Animal Biology II

(Prereq. 18.141; not open to biology majors) **4 Q.H.***

The course offers systematic, comparative study of the structure and functions of animals. Diversity of animals is considered from the standpoint of evolutionary adaptation. Laboratory.

18.143 Human Physiology I

(Prereq. 18.131 and 18.132; not open to biology majors) **4 Q.H.***

The course offers study of the physiology of excitable cells and tissues: nerve and muscle synapses, muscular contraction, neuromuscular reflexes, autonomic nervous system, endocrinology, sensory physiology, and higher nervous function.

18.144 Human Physiology II

(Prereq. 18.143; not open to biology majors) **4 Q.H.***

The course offers study of respiration and circulation: fluids, the heart, cardiovascular regulatory mechanisms and metabolism, gastrointestinal function, renal function. Laboratory.

18.148 Human Anatomy

(Not open to biology majors) **4 Q.H.***

The course focuses on the structure and development of the human body. Laboratory.

18.221 General Microbiology

(Prereq. Permission of instructor; or 12.145, 18.135, and 18.136; required courses may be taken concurrently) **3 Q.H.**

Same as 18.220, but without laboratory. Not applicable for the biology major or graduate credit.

Courses primarily for biology majors or for other students with equivalent background in college science and mathematics. Freshmen intending to major in biology should take the sequence 18.111 to 18.113.

18.111 Principles of Biology I

(Not open to biology majors) **5 Q.H.***

An introduction to the basic principles of biology, the course endeavors to provide an information base for the remainder of the biology core. Topics include scientific method; growth; development; elementary genetics; nutrition; photosynthesis; and respiration. Special emphasis is placed on the role of plants in the biological world. Laboratory.

*Lab fee required.

18.112 Principles of Biology II 5 Q.H.*

(Prereq. 18.111)

Topics include cellular metabolism, molecular mechanisms of microbial life, structure and general physiology of animal cells, and evolution of adaptive diversity among invertebrate animals. Laboratory.

18.113 Principles of Biology III 5 Q.H.*

(Prereq. 18.111 and 18.112)

The course covers discussion of the structure and function of vertebrate animals, including the human species; introduction to the various systems of the body, illustrated with laboratory experiments and animal dissection.

18.131 General Biology 4 Q.H.*

The course focuses on universal properties and processes of living organisms. Topics include cellular composition and cellular control, the evolutionary process, environmental relationships. Laboratory. (Normally not for freshman biology majors)

18.132 Animal Biology 4 Q.H.*

(Prereq. 18.131)

The course offers a systematic comparative study of the structure and functions of animals. Diversity of animals is considered from the standpoint of evolutionary adaptation. Laboratory. (Normally not for freshman biology majors)

18.133 Plant Biology 4 Q.H.*

(Prereq. 18.131-18.132 or 18.111-18.113)

The course offers an introduction to the structure of plant cells, structure and function of roots, stems, and leaves of flowering plants; survey of the major groups in the plant kingdom, including their morphology, reproductive biology, and economic importance. Laboratory.

18.134 Environmental and Population Biology 4 Q.H.*

(Prereq. 18.131-18.133 or 18.111-18.113)

The course offers detailed consideration of the physico-chemical factors influencing and influenced by organisms. The course covers interactions among individual organisms and among species; change of species by genetic natural selection; development of communities and function of ecosystems. Laboratory.

18.135 Genetics and Development Biology 4 Q.H.*

(Prereq. 18.131-18.133 and 12.144)

Course focuses on elaboration of the classic laws of heredity, cytogenetics, molecular basis of heredity, and selected examples of the development of form and function. Laboratory.

18.136 Cell Physiology and Biochemistry 4 Q.H.*

(Prereq. 18.131-18.135, 12.145, and 12.171)

Topics include basic chemical and physical enzyme kinetics; processes of cells related to their fine structure; oxidative and intermediary

metabolism; photosynthesis, membrane phenomena; chemical and physical processes of prokaryotic and eukaryotic cells. Laboratory.

Note: Biochemistry courses that are sequels to 18.136 are listed under interdisciplinary course numbers (93.-).

18.158 Vertebrate Physiology I 4 Q.H.*

(Prereq. 18.131-18.133 and 18.136)

The course covers properties of living protoplasm; the general organization and function of cells; translocation of materials and the organization of animals; the physiology of the skeletal systems of humans and animals; the physiology of amoeboid, ciliary, and contractile movement with emphasis on muscle metabolism; the structure and function of neurons, reflex arcs, the autonomic nervous system, and the sensory receptors. Laboratory.

18.159 Vertebrate Physiology II 4 Q.H.*

(Prereq. 18.158)

Topics include fluid media of animals, emphasizing water and electrolyte balance and kidney function in humans; the physiology of blood, including its formation, functions, clotting antigens, and tests for identifying blood; the physiology of the heart, nervous control of the vascular system, breathing and gas transport, heat regulation, nutrition, digestion and assimilation; the endocrine secretions; and the physiologic aspects of reproduction.

18.206 Evolution 4 Q.H.*

(Prereq. 18.131-18.135)

This is a basic evolutionary course for biology majors and graduate students offering a survey of evolutionary history, evidence, mechanisms, and theories. Topics of current interest in evolution are emphasized.

18.207 Vertebrate Zoology 4 Q.H.*

(Prereq. 18.131 and 18.134)

Lectures emphasize the systematics, natural history, zoogeography, and behavior of all classes of vertebrates. The laboratory consists of identification of preserved specimens and mandatory field and museum trips.

18.208 Comparative Vertebrate Anatomy 5 Q.H.*

(Prereq. 18.131 and 18.132)

The course focuses on morphology and phylogeny of the vertebrates; laboratory studies on taxonomy of the group and specific morphology of the dogfish shark, the mud puppy, the alligator, and the cat.

18.209 Embryology 5 Q.H.*

(Prereq. 18.131, 18.132, and 18.135)

Topics include gametogenesis, fertilization, cleavage, gastrulation, induction, organogenesis, and metamorphosis in vertebrates. Emphasis is on frog, chick, and pig in the laboratory.

18.210 Marine Invertebrate Zoology 5 Q.H.*
(Prereq. 18.131-18.133)

Topics include functional morphology, systematics, ecology, and phylogenetic relationships of the major invertebrate phyla. Emphasis in laboratory is on utilization of living marine forms, with dissection of representative organisms.

18.211 Parasitology 4 Q.H.*
(Prereq. 18.131 and 18.136)

The course focuses on symbiotic relationships of protozoans, mesozoans, flatworms, nematodes, acanthocephalans, and arthropods. Laboratory.

18.212 Vertebrate Paleontology 4 Q.H.*
(Prereq. 18.131, 18.132, 18.134, 18.135; or permission of instructor)

The course examines evolution of the vertebrates, including humans, as revealed through the fossil record. Laboratory, museum, and field studies.

18.216 Herpetology 4 Q.H.*
(Prereq. 18.132 and 18.135)

Lectures emphasize the natural history, behavior, systematics, and zoogeography of recent amphibians and reptiles. The laboratory consists of identification and preparation of preserved specimens, particularly local amphibians and reptiles. Mandatory field trips.

18.217 Mammalogy 5 Q.H.*
(Prereq. 18.131-18.134)

The course offers study of phylogeny, anatomy, physiology, and natural history of mammals. Field collection, laboratory preparation, and study of specimens are included. Laboratory.

18.219 The Microbial World 4 Q.H.*
(Prereq. 18.134 and 12.144)

The course offers study of the position, structure, and function of microorganisms in the natural world, and their utilization by humans from the perspective of their major physiological properties. Laboratory.

18.220 General Microbiology 5 Q.H.*
(Prereq. Permission of instructor; or 12.145, 18.135, or 18.136; required courses may be taken concurrently)

The course provides morphological, ecological, and biochemical consideration of representative groups of bacteria; introduction to virology and microbial genetics; host-parasite relationships, including basic immunological considerations; prokaryotes of medical significance; physical and chemical controls of microbial growth. Laboratory.

18.222 Medical Virology 4 Q.H.*
(Prereq. 18.220)

The course examines fundamental characteristics of animal viruses with emphasis on pathogenesis, clinical pathology, and epidemi-

ology of the common viral diseases, including the tumor viruses and the slow viral diseases. Laboratory sessions focus on methods of working with animals, eggs, and cell cultures in isolating, cultivating, and identifying viruses.

18.227 Animal Histology 4 Q.H.*
(Prereq. 18.132)

The course offers microscopic study of fundamental types of animal tissues. Laboratory.

18.228 Histological Technique 3 Q.H.*
(Prereq. 18.131 and 18.136)

The course provides instruction in general methods of tissue preparation for purposes of microscopic study; preparation of solutions and stains; the microtome and its operation, together with specific directions for fixation, clearing, hardening, embedding, section-cutting, and staining tissues. Laboratory.

18.230 Marine Botany 4 Q.H.*

Subjects covered include taxonomy of the major groups of marine plants, primarily algae; their ecological and reproductive strategies and their economic importance; and their roles in diverse marine communities. Mandatory field trips in addition to laboratory studies.

18.231 Lower Plants 4 Q.H.*
(Prereq. 18.133)

The course offers study of nonvascular plants (algae, fungi, lichens, mosses, and liverworts), including their morphology, ultrastructure, ecology, life cycles, reproductive strategies, and economic uses. Laboratory.

18.232 Higher Plants 4 Q.H.*
(Prereq. 18.133)

The course offers study of vascular plants (club mosses, ferns, gymnosperms, and angiosperms). Origin, ecology, development, structure, paleobotanical evidence, reproductive strategies, and economic uses. Field trips included. Laboratory.

18.234 Plant Anatomy 4 Q.H.*
(Prereq. 18.133)

The course focuses on comparative developmental anatomy of seed plants. Laboratory.

18.235 Economic Botany 4 Q.H.*
(Prereq. 18.133, or 18.111-18.113)

The course offers an in-depth study of the association of plants and men. Subjects include food, beverage, drug, fiber, and medicinal products and crops, both historically and in present-day usage. Laboratory includes making of several plant products (paper, dried fruit, beer, etc.) as well as tours of a brewery, wholesale grocers, ethnic markets, sugar factory, and other places as time permits.

18.236 Horticulture 4 Q.H.*
(Prereq. 18.133 or equiv.)

The course examines basic cultivation methods for ornamental and food plants. Offered at the University greenhouse. Laboratory.

18.238 Local Flora 4 Q.H.*
(Prereq. 18.133)

The course provides a study of local vascular flora (ferns, gymnosperms, and angiosperms), with emphasis on recognition and appreciation of plant family characteristics. Preparation of herbarium specimens is presented. Field trip attendance is required. Laboratory.

18.240 Microbial Physiology 4 Q.H.*
(Prereq. 18.220 or equiv.)

The course focuses on structure and function of the bacterial cell, with emphasis on its general properties as well as on the physical and chemical factors that influence it. Laboratory.

18.242 Medical Microbiology 4 Q.H.*
(Prereq. 18.220 or equiv.)

Topics include host parasite interactions: virulence, toxins, natural flora, immunological responses; characteristics of the common bacterial, rickettsial, and protozoal infections in humans; epidemiology, pathology, vaccines, and chemotherapy.

18.245 Serology-Immunology 3 Q.H.
(Prereq. 18.220 or equiv.)

The course covers basic consideration of the physical and chemical attributes of antigens and antibodies. Antigens of biological significance as well as in vivo antigen-antibody interactions are discussed.

18.246 Serology-Immunology Laboratory 2 Q.H.*
(Prereq. 18.245 taken concurrently)

The course provides laboratory exercises dealing with immunization, quantitative antigen-antibody reactions, electrophoretic studies (agar, acrylamide gel, and cellulose acetate), immuno-fluorescence.

18.248 Marine and Fresh Water Microbiology I 2 Q.H.*
(Prereq. 18.220)

The course examines methodological approaches to the study of the aquatic environment. Shipboard sampling and relevant field trips augment laboratory studies.

18.249 Marine and Fresh Water Microbiology II 2 Q.H.
(Prereq. 18.220)

The course focuses on characterization and differentiation of aquatic micro-organisms. Topics include microbial associations in marine, estuarine, and fresh water habitats. Morphology, physiology, and ecology are stressed.

18.251 Comparative Animal Physiology 4 Q.H.*
(Prereq. 18.132 and 18.136 or equiv.)

The course offers study of animal functions, their control, and their adaptiveness to various environments with consideration of phylogeny of these adaptations and of their underlying

cellular mechanisms. Emphasis is on invertebrates and lower vertebrates, with comparisons to mammals. Laboratory.

18.255 Comparative Neurobiology 4 Q.H.*
(Prereq. 18.136)

The course focuses on structure and function in simple invertebrate nervous systems. Topics include parallel conductance theory at endogenous and synaptic potentials, nerve networks, simple sensory and motor systems.

18.260 Advanced Cell Biology 4 Q.H.*
(Prereq. 18.136 and physics)

The course examines selected topics in cellular structure and function of eukaryotes, e.g., their electrical and mechanical characteristics and the underlying physical and biochemical processes. Topics will vary depending upon the instructor. Laboratory.

18.265 Introduction to Plant Physiology 4 Q.H.*
(Prereq. 18.133 and 18.136, or permission of instructor)

The course focuses on the physiology and biochemistry of plants as a whole and at the cellular and organ levels. Considerations of mineral nutrition, photosynthesis, hormones, growth, and development are included. Attendance at a weekly four-hour lab, as well as preparation of a paper based on the research literature, are required.

18.280 Senior Seminar 1 Q.H.
(Prereq. Completion of biology core, 18.131-18.136)

The course examines recent developments in various topics of zoology, microbiology, physiology, botany, ecology, genetics, and cell biology. Student presentation and analysis are emphasized. Limited to qualified juniors and seniors in the B.A. program and required of seniors in the B.S. program.

18.290, 18.291 Directed Study (each) 2 Q.H.
(Prereq. Completion of biology core, 18.131-18.136)

The course offers independent work on a chosen topic under the direction of members of the Department. Limited to qualified juniors and seniors with approval of the Department and special arrangements with the supervising faculty member. The two quarters of this course together are counted as one elective course in the Biology Department.

18.295, 18.296, 18.297, 18.298 Junior-Senior Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Psychology

For specific scheduling information, students should request a current course listing at the main office of the Psychology Department, 234 Nightingale Hall. Students should note that courses are presented by category and are *not* listed in numerical sequence.

Courses

19.105 Foundations of Psychology I 4 Q.H.

A survey of the fundamental principles and issues of the major areas of contemporary scientific psychology. The study of psychology is approached as a method of inquiry as well as a body of knowledge. Areas emphasized are biological bases of behavior, principles of learning, psychological testing, personality dynamics, psychopathology, and therapeutic approaches.

19.106 Foundations of Psychology II 4 Q.H. (Prereq. 19.105)

A continuation of 19.105 with emphasis on the areas of life-span development, sensory and perceptual processes, cognition and memory, language, motivation and emotion, and social influences on behavior.

19.120 Statistics in Behavioral Science I 4 Q.H.

The course offers an introduction to descriptive statistics (scales of measurement, frequency distribution and graphs, measures of central tendency, dispersion and correlation, standard scores, and the unit normal curve), and probability theory (permutations, combinations, and the binomial theorem).

19.121 Statistics in Behavioral Science II 4 Q.H. (Prereq. 19.120)

The course offers a general presentation of hypothesis testing, including parametric and nonparametric tests, with emphasis on formulating hypotheses and choosing appropriate scales of measurement, tests, and confidence levels. (Continuation of 19.120)

19.130 Social Psychology 4 Q.H. (Prereq. 19.106 or permission of instructor)

The course provides an introductory survey of social psychology. Topics include aggression, attribution, attitude formation, change, measurement, conformity, impression formation, group processes (social facilitation, deindividuation, etc.).

19.135 Personality I 4 Q.H. (Prereq. 19.106)

The course offers a systematic study of the normal personality and its development. Topics include behavioral, dynamic, and constitutional determinants, assessment of personality, research, and a survey of the major theories of personality.

19.136 Personality II 4 Q.H. (Prereq. 19.135)

Continuation of 19.135.

19.141 Human Behavioral Development I 4 Q.H. (Prereq. 19.105)

This course examines the change in behavioral processes from conception up to, but not including, adolescence. Topics include: biological bases of behavioral development, sensory and motor function, learning, socialization, speech and language, imitation, moral development, dependency, aggression, and abnormalities of development. Major theories of development and child-rearing practices are examined. Although relevant comparative research is considered, the emphasis is on human development.

19.142 Human Behavioral Development II 4 Q.H. (Prereq. 19.141)

This course continues the examination of behavioral change from adolescence to death. Topics include: biological, intellectual, learning and memory, personality, and social processes. Different methods of study and theories of adult development are assessed.

19.149 Sensation 4 Q.H. (Prereq. 19.106)

The course provides an introduction to the study of our senses, with emphasis on hearing, touch, taste, and smell. Students have the opportunity to learn how we measure our sensory abilities. Findings are closely related to the functioning of sensory organs—ears, skin, mouth, and nose—and of the sensory nervous system.

19.150 Perception 4 Q.H. (Prereq. 19.106)

The course offers a study of our awareness of the world around us exemplified primarily by visual perception. Topics are explored in group discussions and include light, visual sensory mechanisms, color vision, illusions, consciousness, and dreams.

19.151 Bilingualism 4 Q.H.

Half of the world's population is bilingual, that is, uses two or more languages on a regular basis. And yet bilingualism remains a poorly understood phenomenon surrounded by a number of myths, such as: bilinguals are found in bilingual countries and are equally fluent in their languages; bilingual children suffer from cognitive impoverishment; bilingual education hinders the assimilation of minority groups. The course will review all aspects of bilingualism (in the world, in society, in the child and the adult), as well as discuss topics such as biculturalism and language change.

19.152 Introduction to Phonetics 4 Q.H.

The course offers an introduction to the nature of the speech signal from articulatory, perceptual, and acoustic points of view. Topics include sound measurement, sound classes, and a survey and comparison of speech sounds used in languages in the world. Stress, tone, and intonation. Phonetic classification and transcription of speech as practical tools for students of languages, linguistics, and speech and hearing science.

19.153 Child Language 4 Q.H.

(Prereq. 19.155, linguistics, or permission of instructor)

The course provides a study of the manner in which language develops in children.

19.154 Linguistics of American Sign Language 4 Q.H.

(Prereq. 36.201 or permission of instructor)

Offers students an introduction to basic issues in linguistics through examination of the structural properties of American Sign Language and its comparison with other languages having similar properties. Topics to be covered include phonology (formational properties of signs), morphology (word formation rules, derivation, and inflection; complex verbs, classifiers, verb modulations), semantics (the meaning structure of signs), syntax (the structure of the ASL sentence), and discourse and narrative structure (the structure of ASL utterances in terms of old versus new information and the structure of ASL narratives).

19.155 Language and Cognition 4 Q.H.

(Prereq. 19.106)

This course provides a basic introduction to the human cognition (cognitive psychology) and the psychology of language (psycholinguistics). On the subject of cognition, the course emphasizes the mental processes involved in the acquisition, organization, and use of knowledge, including pattern recognition and memory. On the subject of psycholinguistics, it focuses on the nature and structure of language, various theories of human production and perception of language, and related experimental findings.

19.156 Thought Processes in Children 4 Q.H.

(Prereq. 19.106)

The course offers an introduction to the processes of thinking, from infancy through adulthood. Specific topics include sensory-perceptual development, problem solving, concept attainment, and the development of social and cultural perspectives.

19.157 Cognition 4 Q.H.

(Prereq. 19.155)

Continuation of 19.155, focusing on cognition. This course emphasizes the analysis of perception, memory, and learning within an information-processing framework. Also con-

sidered are selected topics in cognitive development.

19.164 Learning and Motivation I 4 Q.H.

(Prereq. 19.106)

Application of basic behavioral principles to behavioral development, behavior modification, language development, and programmed learning, and their relations to theoretical considerations in the learning process.

19.166 Programmed Learning 4 Q.H.

(Prereq. 19.164)

Development of programmed instruction has been one of the products of basic behavioral research. After students master relevant basic research literature, they are expected to review and evaluate existing instructional programs in light of the underlying behavioral principles. Programs are selected from those useful in the normal and special education classrooms, i.e., complex academic subject matter and individual problem areas.

19.167 Applied Programming Techniques 4 Q.H.

(Prereq. 19.166 and permission of instructor)

Students design, test, and evaluate their own instructional programs for teaching specific subject matter, for remedial application to behavior problems, or for testing basic instructional theory.

19.168 Behavior Therapies 4 Q.H.

(Prereq. 19.106)

The course offers a study of successful projects that have provided effective remediation and rehabilitation in institutions for the mentally ill, the mentally retarded, and the developing human (schools).

19.169 Learning and Motivation II 4 Q.H.

(Prereq. 19.164)

Continuation of 19.164 with emphasis on biological constraints on learning, i.e., punishment, anxiety, aggression, addiction; and other topics of individual interest.

19.170 Language Abnormalities 4 Q.H.

(Prereq. 19.155)

Topics include psycholinguistic methods and findings in the study of aphasia, stuttering, dyslexia, language of the retarded, and other language pathologies.

19.172 Applied Behavior Modification 4 Q.H.

(Prereq. 19.171 and permission of instructor)

Continuation of 19.171.

19.178 Physiological Bases of Psychology I

(Prereq. 19.106)

4 Q.H.

This is an introduction to the relation between brain function and human behavior. Topics include how nerve cells function individually and work together both in small networks and in the nervous system; the structure of the nervous system; how our sense organs provide the nervous system with information about the outside world; how the brain controls movement;

and how psychological concepts such as perception and learning may relate to brain activity.

19.179 Physiological Bases of Psychology II 4 Q.H.
(Prereq. 19.178)

A continuation of 19.178 in which the relation between brain function and more complex behavior is examined. Topics include the multiple kinds of sensory information and the neuronal and hormonal control systems involved in eating, drinking, sexual and reproductive behavior; how brain activity is related to emotion, sleep, wakefulness, and memory; disorders of behavior and of the brain.

19.182 Language and the Brain 4 Q.H.

Linguistic behavior from a neuropsychological viewpoint. Models of how the nervous system, and the brain in particular, controls the production, perception, and internal manipulation of language. Localization of cerebral functions and hemispheric lateralization. Experimental and clinical evidence for functional models. Aphasia and other language pathologies. Schizophrenic language. Evidence from "slips of the tongue." The bilingual brain. Comparisons of speech, sign language, and writing systems. Interpretation and translation.

19.183 Biological Bases of Motivation 4 Q.H.
(Prereq. 19.178)

The course focuses on the mechanisms of eating and drinking behavior, attention, sleep, arousal, and emotional behavior.

19.186 Comparative Psychology and Ethology 4 Q.H.
(Prereq. 19.106 or permission of instructor)

This introductory-level course in animal behavior surveys a wide range of species (reptiles, birds, fish, and mammals, including humans) to find similarities and differences in the behavioral processes and physiological mechanisms by which individual organisms and species adapt to their environments. The first section of the course focuses on adaptive specializations exhibited by animals in learning about their environments during early development and as adults. The second section examines problems of social organizations at the individual level: how animals communicate with each other and transmit "cultural" skills; mechanisms underlying cohesion and dispersal (e.g., reproduction and aggression); and the adaptive advantages of being social or asocial. The final section provides students with an unusual opportunity to apply concepts and experimental methods they have learned by actually doing a short field study of animal behavior at The Boston Zoological Park.

19.192 Sensory and Perceptual Abnormalities 4 Q.H.
(Prereq. 19.150)

The course focuses on some of the peripheral factors that influence perception of the external

world. Discussions consider the manner in which sensory deficits can influence behavior and some of the means of dealing with sensory and perceptual abnormalities. Application of programmed instruction to the development of sensory tests and remedial procedures for nonverbal people, blind or deaf retarded people, young children who have not yet learned to speak, and aphasic patients; the detection of hysterical sensory loss and malingering.

19.193 Functional Neuroanatomy 4 Q.H.
(Prereq. 19.106)

Aimed primarily at the study of the human nervous system, this course focuses on study of the cellular structure of the nervous system, including a cell's organelles, followed by a short study of the embryological development of the nervous system. Systematic study of the nervous system beginning in the spinal cord and ending in the cerebral cortex with primary emphasis on fiber connections. A continuous attempt to correlate structure with behavioral activity.

19.202 Abnormal Psychology I 4 Q.H.
(Prereq. 19.135 or 19.141)

This course offers a study of the abnormal personality, including a historical survey and a discussion of such issues as anxiety, defense mechanisms, and the criteria of psychopathology. Also examined are the symptomatology, etiology, and dynamics of neuroses (hysteria, phobia, obsession, and compulsion) and of psychosomatic disorders. Details of case histories will be discussed.

19.203 Abnormal Psychology II 4 Q.H.
(Prereq. 19.202)

The course offers a survey of psychological and somatic therapies. Symptomatology, etiology, dynamics, and therapy of psychoses (schizophrenia, paranoia, mania, depression). Sociopathic and organic disorders.

Directed Study—Honors Courses

19.290, 19.291, 19.292, 19.293, 19.294
Directed Study (each) 4 Q.H.

(Prereq. Permission of instructor)
This course offers independent work under the direction of the Psychology Department, usually in a research project in one of the Department laboratories. Faculty members normally require completion of advanced laboratory courses in the area of research interest, but this is a matter of individual discussion. Students interested in Directed Study should consult a departmental adviser.

19.295, 19.296, 19.297, 19.298, 19.299 Junior-Seniors Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Laboratories

19.133 Laboratory in Social Psychology 4 Q.H.* (Prereq. 19.121 and 19.130)

The course provides an introduction to the methods of social-psychological research. The purpose of the course is to assist students in developing the ability to read published social research with a critical eye, to pose questions in a testable manner, to apply experimental methods to social research, and to express themselves in APA-journal style.

19.138 Personality Laboratory 4 Q.H.* (Prereq. 19.121 and 19.135)

The course provides an introduction to the methods and areas of personality research. Includes a discussion of problems of measurement, control, and interpretation. Representative published experiments will be examined critically. Students are expected to design, collect data for, assess, and write up several experiments, including one original research project.

19.158 Cognition Laboratory 4 Q.H.* (Prereq. 19.121 and 19.157)

Experiments related to topics in 19.155 and 19.157.

19.160 Experimental Design in Psychology 4 Q.H.* (Prereq. 19.106 and 19.121)

The course focuses on the experimental method in the design, execution, analysis, and reporting of psychological investigations of humans and animals.

19.162 Sensation and Perception Laboratory 4 Q.H.* (Prereq. 19.121 and 19.149 or 19.150)

Experiments involving precise measurements of both physical and psychophysical phenomena, including auditory function, color vision and after-effects, muscular sensation, tactile sensitivity, and adaptation to perceptual distortions.

19.165 Learning and Motivation Laboratory 4 Q.H.* (Prereq. 19.121 and 19.164)

Through direct experience, students have the opportunity to gain proficiency in laboratory analysis of behavior and in evaluating common generalizations about human behavior. Students are expected to design and perform experiments in animal and human learning, memory, decision processes, concept formation, and other topics of individual interest.

19.171 Behavior Modification Laboratory 4 Q.H.* (Prereq. 19.165 or 19.178, and permission of instructor)

Students have the opportunity to participate in education and training of severely and profoundly retarded residents at the Walter E. Fernald State School. Learning theory principles are applied to teaching new skills and to treating inappropriate behavior. Students have the op-

portunity to write individual and group training programs, implement them in a classroom setting, and learn methods for evaluating program success.

19.181 Laboratory in Neuropsychology 4 Q.H.* (Prereq. 19.180 or 19.178 or permission of instructor)

Laboratory experiments based on 19.180 discussion topics.

19.188 Sensory Physiology Laboratory 4 Q.H.* (Prereq. 19.178)

Experiments are performed to illustrate the physiological techniques in sensory psychology, including electrical recordings of some activities that accompany visual, auditory, and cutaneous activity.

19.195 Laboratory in Psycholinguistics 4 Q.H.* (Prereq. 19.120 and 19.155)

The course provides students the opportunity to acquire first-hand experience in conducting research on problems in the psychology of language. Students are involved in all aspects of each experiment, including collecting and analyzing data and preparing reports. Classroom discussion focuses both on the particular experiments conducted and on the implications of the experimental findings for broader issues in the psychology of language.

Seminars

19.180 Seminar in Neuropsychology 4 Q.H. (Prereq. 19.178)

For students who desire intensive study, discussion, and practice in laboratory studies of physiological variables. Topics include evolution of the nervous system, sensory and motor mechanisms, motivation and emotion, sleep, attention and perception, learning, and memory.

19.187 Sensory Physiology Seminar 4 Q.H. (Prereq. 19.178)

The course concentrates on the psychophysiology of various sensory systems, vision and hearing in particular. Discussions are concerned with the problem of accounting for sensory phenomena in terms of physiological concepts.

19.270 Seminar in Behavior Theory 4 Q.H. Topics vary from term to term. For specific information, call ext. 3076.

19.271 Seminar in Cognition 4 Q.H. Topics vary from term to term. For specific information, call ext. 3076.

19.272 Seminar in Psycholinguistics 4 Q.H. (Prereq. 19.155 or permission of instructor)

The seminar focuses on the on-line processing of language. Recent research is discussed in light of such questions as: While listening to someone speak, how does the listener process

the information carried by the acoustic signal? What is the role of linguistic rules, prediction strategies, and contextual information? And when speaking, what processing stages are involved from the moment the speaker decides to speak to the moment the articulators start functioning? These and other questions will be discussed, as will experimental techniques and current trends in psycholinguistics.

19.273 Seminar In Clinical Psychology and Personality 4 Q.H.
(Prereq. 19.202 or permission of instructor)

The course offers seminar presentations of topics relevant to understanding the normal and disturbed personality. Possible topics: specialized assessment procedures, cognitive styles in personality, temperament, hypnosis, anxiety, aggression, specialized clinical syndromes, and the development of conscience.

19.274 Seminar In Sensory and Physiological Psychology 4 Q.H.
(Prereq. Permission of Instructor)

19.275 Seminar In Social Psychology 4 Q.H.
(Prereq. 19.130 and 21.107, or permission of instructor)
Students are expected to examine and present in class their findings on a particular topic in social psychology, for example, attribution, aggression, conformity, attitude-behavior relationship.

19.276 Seminar In Behavior Modification 4 Q.H.
(Prereq. 19.165)

Topics in behavior modification are discussed in a seminar format.

Teaching Practica

Students who have mastered one of the Department's self-paced courses may request permission to enroll in the correlated Teaching Practicum, with elective credit applicable to the major within the limits noted in the major requirements handbook. Students have the opportunity to learn how to design instructional materials, give tutorials, and solve study problems in the subject matter of the self-paced course.

19.250 Teaching Practicum In Foundations of Psychology I 4 Q.H.
(Prereq. 19.105 and permission of instructor)

This course is designed to assist students in learning practical teaching skills as well as theoretical principles associated with personalized instruction. Teaching responsibilities include interactions with students in 19.105 for four hours each week. In addition, a special Saturday conference and weekly staff seminars will provide opportunity for discussion and give the undergraduate the opportunity to become acquainted with relevant literature.

Topics In Psychology Series (TIPS)

General interest, no-prerequisite courses in psychology.

19.148 Sleeping and Dreaming 4 Q.H.
What makes us dream? How important are sleeping and dreaming to physical and mental health? To assist students in understanding the nature of sleeping and dreaming, this course draws on findings and theory in psychology and neuropsychology.

19.230 Psychological Testing: Science and Politics 4 Q.H.

After an analysis of the basic principles of psychological test construction and the characteristics of various tests, the course focuses on the political and sociological problems associated with psychological assessment. Emphasis is on the uses and misuses of tests; social, cultural, and racial issues in intelligence testing; and the heredity-environment controversy in I.Q. testing.

19.231 Marriage and the Family 4 Q.H.
Problems typical in some marriages are discussed, including alcoholism, sexual inadequacy and dissatisfaction, separation and divorce, death of a spouse, and child rearing.

19.232 Mind and Brain 4 Q.H.
The science of neuropsychology assumes that for every state of the mind—perceiving, thinking, dreaming, pleasure, pain, etc.—there is a corresponding brain state. This course examines explorations of brain function that have increased our understanding of experience and behavior. Contemporary questions to be discussed include: 1) How is it that a single human brain can store more information than all the libraries of the world? 2) What kind of brain is needed to make language possible? 3) What is the impact of brain damage on states of mind? 4) Is the child's brain more plastic than that of the adult? 5) Do psychological disorders result from a disruption of the natural harmony between the brain's chemistry and its environment? 6) What is the nature-nurture controversy about? 7) How did brains and consciousness evolve? 8) Are there male and female brains?

19.234 The Disordered Mind 4 Q.H.
This course may assist in providing an understanding of disturbed human behavior: how to recognize it, what causes it, and how to treat it. A wide range of disorders is discussed, from minor behavioral disturbances to neuroses, depression, and schizophrenia.

19.235 Animal Communication 4 Q.H.
How do animals communicate and how are we attempting to communicate with them? This course examines and compares the communication systems used by animals such as

birds, bees, whales, dolphins, and the primates, including chimps and humans. From the four perspectives of biology, linguistics, psychology, and sociology, recent attempts to teach other primates some of our languages (sign language, speech, manipulation of tokens or computers) are revealing what it means to be a human in the animal kingdom.

19.236 Man In Isolation 4 Q.H.

Children raised in the wilds, children isolated in society, and adults placed in experimental isolation are the subjects of this course, designed to reveal what part of human nature actually requires interaction with other human beings, what part is programmed biologically, and how these work together to make us human.

19.238 Behavior Problems and Their Therapies 4 Q.H.

This course offers a broad introduction to behavior therapies and their use in treating behavioral problems such as fears and phobias, compulsions, overeating, educational difficulties (including inattention and poor study skills), alcoholism, marital and family difficulties, and sexual deviation. Theoretical, practical, legal, and ethical issues will be examined.

19.239 Infant Development 4 Q.H.

In the last few years, new techniques have provided psychologists with a means of asking more precise questions about infants—and some of the answers have been truly remarkable. It is becoming increasingly apparent that the infant possesses highly developed capacities and that its course of development involves a complex interaction between experience and these innate abilities. This course examines, in historical perspective, these new findings about infants, focusing on what is known about infancy and the various techniques used to study infant behavior. A number of aspects of development will be considered, including social, motor, perceptual, cognitive, and language.

19.244 Sexual Behavior 4 Q.H.

This course is concerned with the sexual activities of the human male and female from infancy to adulthood. It considers the importance of sexual factors in the life history of the individual, statistical surveys of sexual behavior, and direct observational measures of sexual responding. Included are the nature of love, responses to pornography, prostitution, bisexuality, male and female homosexuality, rape, child abuse, and sexual therapy.

19.245 Your Memory: How it Works 4 Q.H.

This course provides an analysis of the operation of memory in humans and animals, including factors from learning and physiology. Special attention is given to human verbal and conceptual memory, and classic and modern systems for memory extension and improvement. Practical exercises on methods of remembering are included.

19.246 Psychology and the Law 4 Q.H.

How does psychology enter into the various phases of the judicial process? The class traces the effects of psychological factors through the course of a trial, including such issues as accuracy of eyewitness identification, plea bargaining, jury selection, persuasion tactics in the courtroom, presumption of innocence, jury size, jury decision rules, and sentencing and punishment.

19.247 Body Language 4 Q.H.

This course examines the messages we send by posture, facial expression, gesture, gait, and interpersonal distance. It goes on to explore how power, status, and gender affect nonverbal communication.

19.248 Magic and Illusion 4 Q.H.

This course investigates visual, auditory, and kinesthetic illusions and constancies, demonstrating the manner in which we can be misled by our perceptions and how professionals, such as magicians (who will demonstrate certain topics), take advantage of this fact.

Note: See Modern Languages, 36.—for courses in American Sign Language (formerly 19.—).

Anthropology

20.100 Introduction to Anthropology 4 Q.H.

The course provides a survey of basic anthropological concepts, including human evolution, culture, and linguistics, with comparative analysis of such socio-cultural institutions as kinship, economy, polity, and religion, especially in nonwestern societies.

20.105 Visual Anthropology: Camera on Culture (Formerly Visual Anthropology) 4 Q.H.

This course explores the anthropologist's use of film to gather information and analyze cultural

subsystems. In addition to reading about and viewing films on particular peoples, a "laboratory" aspect of the course involving the use of tape and video equipment introduces students to the field.

20.108 Cultural Meaning and Everyday Experience 4 Q.H.

This course uses anthropological ideas to study the underlying patterns of meaning that lie below the surface of everyday thought and behavior. Topics include study of daily routines,

leisure activities, joking and humor, speech patterns, current folklore and mythology, non-monetary economic transactions, kinship and friendship relations, and religion and ritual.

20.120 Introduction to Archaeology 4 Q.H.

This course offers a survey of the history of development of archaeology focusing intensively on key sites in the new and old worlds. Film and slides of sites and artifacts are used extensively.

20.130 Language and Culture 4 Q.H.

Topics include the function of language in human society and an introduction to the relation between the patterns of language and the patterns of culture.

20.131 Folklore 4 Q.H.

This course focuses on cross-cultural comparisons of oral narrative traditions and literary sources. Various methods of analysis of folklore and its place and function in society and culture are examined. Identification of and methods for collecting material from local, currently active folklore traditions are given special attention.

20.132 The Anthropology of Music 4 Q.H.

This course offers an examination of music in a prehistoric and cross-cultural perspective, with emphasis on ethnomusicology and the comparison of western and nonwestern musical culture. Functions and social contexts of musical composition and performance; the ethnography of musical performance groups; the analysis of music as a form of communication.

20.135 Individual and Culture 4 Q.H.

This course explores the ways in which individuals are shaped by society and the ways in which they can effect change.

20.137 Culture and Mental Illness 4 Q.H.

This course offers discussions and analyses of the nature and meaning of culture, the role of culture in personality formation, culture and anxiety, anthropological approaches to the "normal" and the "abnormal," and the question "Is mental illness psychological fact or cultural fiction?"

20.140 Evolution and Society 4 Q.H.

This course focuses on human social and cultural evolution and the theories that account for it.

20.151 Aggression 4 Q.H.

Focuses on concepts of aggression and how they affect our understanding of human society. Draws on materials collected by anthropologists, psychologists, and ethnologists.

20.157 Primitive Religion 4 Q.H.

The course focuses on nature and institutionalization of "primitive" religion. Topics include exploration of religious concepts and

movements in relation to social, economic, and political organization.

20.158 The Anthropological Study of Myth 4 Q.H.

The course focuses on theories concerning the nature and meaning of myth. Exploration of the function of myth in social and cultural change. The structural analysis of myth.

20.160 Sex, Sex Roles, and Family 4 Q.H.

The course analyzes popular and scientific notions about sex and family by examining the social patterning of interactions in our culture, other cultures, and other species. Emphasizes the changing relations between men and women. (See also 21.121.)

20.170 Culture in Transition 4 Q.H.

The course offers analysis of the changing patterns in social, economic, and political institutions. Modern social trends are discussed.

20.210 Tribal Societies and Cultures 4 Q.H.

The course focuses on the structures and institutions of bands, tribes, and chiefdoms; comparative and functional studies of tribal societies and the dynamics of change under contact situations.

20.214 Peasant Society and Culture 4 Q.H.

Focuses on the dilemma of attempts by peasant societies to preserve traditional cultural forms in the face of increasing external economic and political pressures. Covers the origins of the peasantry, diversity and uniformity in peasant societies, the transformation of peasants into the modern urban and rural poor, and the politics of peasant protest and revolution.

20.215 Peoples Who Live by the Sea 4 Q.H.

Course material includes examination of fishing, trade, shipbuilding, recreation, smuggling, and other uses of the sea; the social ecology, lifestyles, economics, and politics of seacoast perspectives of evolutionary and community systems theory. Research projects dealing with current issues, site visits, and field trips are required.

20.220 Anthropology Methods 4 Q.H.

The course examines theory and practice of methods of field research and data analysis. Students have the opportunity to take part in a field project.

20.230 Language and Communication 4 Q.H.

The course focuses on human communication, including language, theories of the evolution of language; language and kinesics, semiotics, social class, linguistic nationalism; linguistic problems in modernization.

20.240 Human Origins 4 Q.H.

The course offers an intensive look at the data on fossil remains and contemporary primates, which are essential for an understanding of human physical and behavioral evolution. Ef-

forts are made to bring the student into direct contact with primary materials.

20.245 Cultural Ecology 4 Q.H.

The course offers an introduction to questions of human adaptation to environment and the effect of different adaptations on natural systems.

20.250 Political Anthropology 4 Q.H.

The course investigates the origin and growth of the institutions of civilization. Topics include specialization and social stratification in the dynamics of traditional civilizations. Some special topics of contact and change.

20.252 The Anthropology of Law and Conflict 4 Q.H.

Topics include settling disputes in stateless societies; forms and mechanism of social control; law as an indicator of cultural and social norms; the study of conflict resolution as an ethnographic tool. Some field research and analysis are required.

20.255 Economic Anthropology 4 Q.H.

The course examines types of economic systems in simple societies: reciprocal, redistributive, market exchange; economic relations as part of social relations; land-tenure systems, credit systems, savings mechanisms. The transition from subsistence to cash economics.

20.257 Religion and Myth 4 Q.H.

The course explores selected problems in anthropological studies in urban societies.

20.259 Urban Anthropology 4 Q.H.

The course explores selected problems in anthropological studies in urban societies.

20.260 Kinship and Society 4 Q.H.

This is a course for the advanced student only. A variety of kinship systems, their terminological and structural components, and the way in which they articulate with other social institutions are studied.

20.270 Social Change and Economic Development 4 Q.H.

Selected topics in the socioeconomic transformation of the world produced by the industrial revolution. Focuses on the impact of the modern world system on traditional cultures and contemporary Third World countries.

20.280, 20.281, 20.282, 20.283, 20.284, 20.285, etc. (each) 4 Q.H.

These are ethnographic area courses (New World Indian, African, Indian, Mediterranean, etc.) which will be offered as the Department's resources permit.

20.290, 20.291 Directed Study 4 Q.H.
(Prereq. Department approval)

The course offers independent work on a chosen topic under the direction of members of the Department. Limited to qualified seniors preparing in anthropology with approval of the Department chairperson.

20.295, 20.296, 20.297, 20.298 Junior-Senior Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

20.801, 20.802 Theory

Qualified undergraduates may wish to take this graduate school course. Permission of the instructor is required for registration.

Sociology

21.100 Introduction to Sociology 4 Q.H.

The course explores basic concepts and theories concerning the relation between individuals and society. Emphasis on the influence of culture, social structure, and institutions in explaining human activity. Social groups, socialization, community, class, power, and social change, among other substantive issues, will be discussed and analyzed.

21.103 Sociology of Boston 4 Q.H.

(Does not meet elective requirement for sociology/anthropology major)

The course examines the city of Boston from the perspectives of environmental development, neighborhood and intergroup relations, institutional services, and symbolic meanings. The city is a laboratory for exploring people's search for a lifestyle and the satisfaction of their needs. Field trips with workbook are required. Documentary and literary sources for term paper report are used.

21.104 Doing Sociology 4 Q.H.

A research approach to sociology. Focus on students' participation in their own learning about sociology as a body of knowledge and as a method of studying social life. Students will use the computer during the course.

21.107 Social Psychology 4 Q.H.
(Prereq. 21.100 or permission of instructor)

The course offers a socio-psychological approach to individual behavior in social contexts; introduction to basic concepts, such as socialization, identity, self-concept, role conflict, attitudes and attitude measurement, and groups and group processes, as well as an overview of major theoretical orientations and important substantive topics.

21.109 The Sociology of Everyday Life 4 Q.H.

The course examines the development, application, and consequences of rules for everyday activities (e.g., walking, talking, eating, drinking, sitting, smoking, laughing, crying, and sleeping); the effects of artifacts, culture, space,

and territory on these activities, on social life, and on the expression of emotions.

21.110 Contemporary Japanese Culture and Society 4 Q.H.

Focus on contemporary Japanese urban society. Topics include: major values, family structure, sex roles, social control, the economy and the division of labor, mass media, religion, arts, and special problems.

21.111 American Society 4 Q.H.
(Prereq. 21.100 or equiv.)

The course focuses on American society, culture, and major social institutions: economic, religious, governmental, familial, educational, welfare, and recreational; social classes and stratification, mobility, and individualism.

21.112 Sociology of Poverty 4 Q.H.

The course offers an analysis of American poverty in historical perspective, drawing on comparisons with other countries. Critical evaluation of sociological research and theories relating to poverty. Consideration of causes and effects of poverty, as well as societal responses to poverty and its consequences. Suitable for students in applied fields, such as nursing, criminal justice, education, allied health, pre-med, and pre-law.

21.116 Environment and Society 4 Q.H.

This course examines the complex relations between human populations and their environments. Issues such as energy, pollution, food supplies, resource availability, and conservation are treated as societal phenomena that involve human values and decision-making processes as well as technical information from a variety of scientific fields. The course will include practical experience in environmental problem solving.

21.118 Population and Society 4 Q.H.

The course examines traditional and contemporary approaches to human population and its control. Topics include factors affecting birth and death rates; societal implications of population quantity and quality in several situations, past and present; rural-urban migration and mobility; racial, genetic, stratificational components for population analysis. Public policies and responses to fertility control in several societies. International efforts to understand and generate action on population issues.

21.120 Sociology of the Family 4 Q.H.

Topics include the family as a social institution in several selected cultures; interrelations of the family and political, economic, and educational institutions; social nature of personality; role taking; individualism, mobility, and industrialism.

21.121 Sex-Gender Roles in a Changing Society 4 Q.H.

The course offers review and application of theories about the determinants of sex statuses

and roles, from historical and cross-cultural perspectives. The focus of the course is on women's status in different institutional structures of American society.

21.125 The Sociology of Private and Public Assistance 4 Q.H.

The course offers analysis of the functions of society's private and public assistance efforts. The socio-political, economic, and psychological factors in public welfare and the helping professions.

21.128 Military and American Society in a Nuclear Age 4 Q.H.

Keeping out of war, winning war, and keeping peace have been major concerns during the past 45 years. In this course, we will investigate the relationship between military and society. Selected issues will include: 1) an analysis of the impact of the military on social institutions such as the family, polity, and economy; 2) an examination of the arms race and upheaval in social life; 3) the legitimization crisis of the U.S. military; 4) the role of women and minorities as reserve armies; and 5) military spending and domestic social problems.

21.131 Law, Crime, and Social Justice 4 Q.H.

Analysis of the impact of the legal system on the creation and perpetuation of criminality in contemporary American society. Particular attention is devoted to the study of the creation of criminal law, the judicial process, and the role of law in the gap between crime and social justice. Field trips will focus on criminal arraignments, trials, and sentencing in the Boston Municipal Court and Suffolk Superior Court. Suitable for students in prelaw, criminal justice, political science and allied fields.

21.132 Class, Crime, and the Police 4 Q.H.

This course summarizes the major psychological, social, biological, economic, and political theories about the cause of crime. It then applies these theories to the day to day operations of the police, courts, and prison system in the United States. Various attempts to lower the crime rate through such policies as "scared straight" programs, the death penalty, stricter and looser prisons, increased police presence, and behavioral conditioning will be examined.

21.135 Juvenile Delinquency 4 Q.H.

The course examines the sociological and psychological approaches to and their implications for a typology of delinquency; problems of prevention, treatment, and rehabilitation.

21.136 Violence in the Family 4 Q.H.

The course offers an examination of the physical, emotional, and sexual violence that occurs in families, with particular emphasis on child and spouse abuse. Definitions, prevalence, causes, prevention, and treatment of specific cases of domestic violence are analyzed. Social

policy issues and problems of legal intervention are a primary focus.

21.137 The Sociology of Deviance 4 Q.H.
(Formerly Social Deviance)

The course explores the conditions under which people categorize others as different; processes by which persons so defined are assigned deviant status and assume appropriate roles and self-images; development of deviant careers and their relation to deviant subcultures; situations in which people transform deviant identity.

21.138 Social Control 4 Q.H.

The course examines formation of social bonds and the conditions under which they are ruptured; the emergence of deviance as an interactional problem; individual and societal reactions to the most prevalent forms of deviant behavior. Analysis of agencies of social control, their definitions of problems, and responses to typical clients.

21.139 Social Problems 4 Q.H.

(Prereq. 21.100 or permission of instructor)

The course offers analysis of five major sociological perspectives on social problems (pathology, disorganization, value conflict, deviance, and labeling); the conditions under which certain recurrent events, activities, and persons become redefined as social problems (e.g., mine disasters, marijuana smoking, and alcoholism); study of the typical responses to social problems and their consequences.

21.141 Drugs and Society 4 Q.H.

The course offers an introduction to the sociology of drugs. The course first examines social definitions of drugs, conditions of their use, and socialization into drug use. It then considers deviant drug use and effects of social control on definitions and use. A range of licit and illicit drugs will be considered, but major emphasis will be given to alcohol, marijuana, and heroin.

21.142 Sociology of Alcoholism 4 Q.H.

The course focuses on social responses to deviant alcohol use. The course examines, in sequence, drinking cultures and drinking practices in the United States; processes by which people are labeled "alcoholics"; and the role of agencies of social control, such as the criminal justice system and the health care system, in labeling and in rehabilitation.

21.143 Food and Hunger 4 Q.H.

Systematic examination of the *social causes and consequences* of hunger, and alternative approaches to solving world hunger.

21.144 Alcohol Use and Social Control 4 Q.H.

All societies define and enforce rules on the use of alcohol. This course examines the conditions under which alcohol use disrupts social life; the processes through which alcohol controls, informal and formal, come into being; the development changes and consequences of

these controls. Case studies of Prohibition, regulation of the alcohol beverage industry, legal drinking age, drinking and driving, and public drunkenness will be included.

21.145 Cities and Society 4 Q.H.
(Formerly Urban Society)

Topics include the foundations of urban life in historical perspective; relation of city life to environment, population, social organization, technology and cultural values; growth trends, urbanization, urban planning, and citizen action.

21.146 Suburb and Metropolis 4 Q.H.

(Prereq. 21.100 or "equiv.")

The course explores ecology of suburban and metropolitan growth, impact on center city and rural fringe, emergent life styles and institutional forms. Compares interdependence, issues of identity, autonomy, and accessibility. Analysis of different types of metropolitan political, social, and economic institutions. Prospects for regional action.

21.150 Race and Ethnic Relations 4 Q.H.

(Prereq. 21.100 or "equiv.")

The course focuses on racial and religious groups, particularly with reference to the United States; special emphasis on historical development, specific problems of adjustment and assimilation, and specific present-day problems and trends.

21.151 Sociology of Prejudice 4 Q.H.

(Prereq. 21.100 or permission of instructor)

This course examines factors in the development and maintenance of prejudice and discrimination. Topics include American race relations, anti-Semitism, sex roles, and stereotyping.

21.152 Race and Ethnic Relations: A World Perspective 4 Q.H.
(Formerly Comparative Race/Ethnic Relations)

This course offers a cross-cultural analysis of race and ethnic relations in western and non-western societies. Explanations of race and ethnic relations in terms of contemporary developments, world problems, and ideological conflicts are included.

21.154 Sociology of Mental Health 4 Q.H.

(Prereq. 21.100 or equiv.)

The course provides a survey of sociological perspectives on mental health and mental disorder. Discussions, readings, and presentations explore the social history of mental illness, epidemiology, cross-cultural perspectives, patients' careers, social institutions of treatment, and policy implications. Areas of convergence between sociological concepts and psychiatry are examined.

21.155 Medical Sociology 4 Q.H.

(Prereq. 21.100 or permission of instructor)

The course provides an examination of the professions, training, institutions, and problems in

health care, with an emphasis on those in the United States. Practical issues in the improvement of health care systems are considered.

21.156 Health Care as a Social Issue 4 Q.H.
(Prereq. 21.100 or permission of instructor)

The course explores the social and political dynamics of health care: who benefits from the system and defends it, who works for change, who wins and why. Topics include the social history of health care, occupational politics, community power structure and the health care setting, the planning and delivery of health services to "haves" and "have-nots," and the role of citizens in determining the future of health care through activism, lobbying, legislation, and participation in controlling the system. Case examples will be provided.

21.157 Sociology of Human Service Organizations 4 Q.H.

If human service organizations are to deal with society's problems they must address organizational problems and maximize efficiency and effectiveness. This course examines the principles of informed management and organizational problem solving in a variety of human service settings, social service agencies, hospitals, government bureaucracies, and schools. Topics include theories of organizational behavior and structure, decision making, leadership and authority, goal analysis, and work and satisfaction.

21.158 Death and Dying 4 Q.H.
(Prereq. 21.100 or permission of instructor)

The course focuses on the treatment of death and dying, including problems faced by health care professionals, family members, institutions, the funeral industry, and the dying themselves. The course will discuss cross-cultural perspectives, the social distribution of mortality, the changing nature of death, and the ethical problems in determining life and death with particular attention to such issues as abortion, suicide, and ceasing medical intervention.

21.159 Aging and Society 4 Q.H.

The course offers a survey of issues and questions on aging, with special attention to social and economic consequences of the aging process, including retirement and productivity, health care problems, nursing home residences, widower- and widowhood, and the approach of death. Examples relating to aging in other cultures are presented in a search for new answers to social problems of aging in the United States. Students have the opportunity to learn to anticipate, cope with, and even prevent problems of aging that concern self, family, and clients/patients.

21.161 Social Inequality and Communication 4 Q.H.

The course provides an analysis of the ways in which groups and institutions, in both their ritual

and everyday activities, communicate the idea of hierarchy and an individual's place in it through face-to-face interaction, formal communication, and the use of space and time. A dramaturgical approach to social organization with special emphasis on status images in the media and the communication of social place by service organizations and professional groups. Includes some content analysis and observational field-work.

21.163 Students, Schools, and Society 4 Q.H.
(Prereq. 21.100)

This course emphasizes the role of education in processes of socialization, social mobility, social control, and social change. Do social characteristics (sex, race, class, age, physical status) influence the school experience? Do schools provide opportunity and initiate change, or do they perpetuate the status quo in economic, political, and social life? Who goes to school, where, for how long, and with what result? How does educational advantage or disadvantage get translated into jobs and social status? Students are encouraged to draw on their own experiences to develop paper topics.

21.164 Sociology of Work 4 Q.H.

This course examines the varieties of work in American society, from blue collar to managerial and professional occupations. Topics include job dissatisfaction and professional burnout, changing shape of the labor market, women and work, participation and humanization of work, the impact of computers.

21.165 Sociology of Business/Industry 4 Q.H.

The course focuses on the role of industry in modern society; similarities and dissimilarities among industrial societies, bureaucracy and its alternatives, unions, supervision democracy and manipulation, the worker on the assembly line, sabotage of the organization, and the role of wages and alienation.

21.166 Social Roles in the Business World 4 Q.H.

The course offers an analysis of the social structure of corporate and business life in contemporary America. Case studies from major accounting and/or industrial firms are presented and discussed. The "career line" in the world of business and management will be examined with a special focus on age/sex, racial/ethnic, and class/income barriers.

21.168 Women Working 4 Q.H.

Differences in the labor force experience of men and women workers generally go unrecognized, and the work experience most common to women—household work—is rarely analyzed. This course will cover women's market and non-market activities, their rewards, and their problems, in addition to empirical and theoretical analyses of the work roles of women. Overall, the course will underscore the differences between work experiences of men and women.

21.170 Sociological Perspectives on Consumerism and Consumer Behavior 4 Q.H.
(Replaces 21.167)

The course offers an analysis of consumer-oriented issues, including interest groups, needs, values, institutional networks, decision-making processes, and situational impacts. Exploration of systemic benefits and costs of consumer-relevant actions.

21.173 Computers and Society 4 Q.H.
(Prereq. Ability to program a computer)

Examines the impact of the computer "revolution" on the conditions of work and life in contemporary society and on legal and theoretical conceptions of human society and consciousness.

21.175 Technology and Society 4 Q.H.

Does society control technology or is technology directing society? Has technology become dehumanized? How valid is the doctrine of technological inevitability? Can the technological "fix" be viewed as a solution to social problems? Is technology itself a social problem? What can be expected of technology assessment? What of the back-to-nature and anti-technology movements today: are they the waves of the future? These are some of the questions and issues that are discussed and analyzed. Students are expected to do considerable independent study and research.

21.176 Science and Society 4 Q.H.

Science has had profound effects on our society, and scientists have seen the ways in which political, economic, and social forces have guided developments in their fields. Issues such as "responsibility" and "autonomy" created by this interdependence will be explored. Emphasis is on the social structures within which science operates and is communicated, and on science as an occupation and profession, as well as a system of thought and set of tools for producing knowledge.

21.180 Sociology of Religion 4 Q.H.
(Prereq. 21.100)

The course offers a comparative and analytic treatment of religion as a social institution, focusing on the relations between religious organizations and other social institutions, with particular emphasis on the American experience. Religion as an agent of social change and stability is included.

21.185 Sociology of the Arts 4 Q.H.
(Prereq. 21.200)

The course offers an examination of the relation between the social organization of society and the forms of art produced—the social role of the artist, how the arts are "manufactured" and distributed, the art consumer's relation to art and the artist, social support for the arts. The

course deals with a variety of art forms, with emphasis on the performing arts.

21.190 Leisure, Sport, and Society 4 Q.H.

The course provides an analysis of the social origins and functions of leisure activities, with special emphasis on games and sports as forms of leisure. Considerable emphasis is given to cross-cultural and historical analysis as well as to the relation between leisure activities and various social institutions—economy, polity, family, and religion.

21.200, 21.201 Group Behavior I and II 8 Q.H.
(Formerly Group Behavior—The Sociological Imagination)

The course explores how individuals interact in groups and how groups interact with each other. The reflexive self, social aspects of language, situational learning, group perspectives, careers, institutions, and worlds.

21.207 Seminar in Social Psychology 4 Q.H.

Focus is on the interaction of psychological and group processes. Students are required to read original theoretical and research monographs in the field. Topics may include prejudice, reference groups, sex roles, conformity, leadership, aggression, communication, collective behavior, and achievement.

21.215 Collective Behavior 4 Q.H.

Topics include the rise of new group forms in response to persistent social unrest; study of masses, crowds, and publics; analysis of specific instances of collective behavior such as race riots, wildcat strikes, prison revolts, and campus disorders.

21.217 The Sociology of Mass Communication
(Formerly Mass Communication and Public Opinion) 4 Q.H.

Topics include factors in the formation and development of public opinion, the effect of television on children, mass communication as social organization, media-depicted images of society, the role of personal influence, the process of rumor, the use of mass media by the poor, propaganda analysis, and the latent and manifest functions of mass communication.

21.218 American Demographics 4 Q.H.

This course is essentially an applied research experience in which students have the opportunity to study the major areas of demography. The focus of the course is on the resources of the U.S. Census Bureau and, in particular, the data products available from recent census surveys.

21.221 Seminar in Social Welfare 4 Q.H.

Discussion of problems in social welfare observed in the term between "Problems" and "Practicum." A research paper, based on directed fieldwork in the intervening term, is the major course requirement.

21.231 Sociological Theories of Crime 4 Q.H.

The course explores patterns and social forces involved in criminal behavior. Analysis of sociological theories of criminality and comparison of these with other explanations of crime.

21.232 Applied Sociology: Practice and Theory 4 Q.H.

The course provides an analysis of the conditions under which sociological knowledge is applied to social problems, the kinds of problems, and the degree of effectiveness of this application. Particular attention is paid to research and demonstration projects that derive from sociological theory.

21.237 Social Deviance II 4 Q.H.

The course offers an examination of the leading theories of deviance (anomie, subcultural deviance, labeling) and their principal variants; study of their assumptions, conceptions, propositions, and supportive evidence; analysis of empirical studies in each theoretical tradition.

21.238 Social Policy and Social Intervention (Formerly Social Control II) 4 Q.H.

The course focuses on study of the formation of social policies in response to social problems, analysis of policies and problems, supporters and opponents of policy change, conditions under which control agencies adopt new policies, and effects of policy change. Particular emphasis on case studies of social action and legal change.

21.239 Introduction to Statistical Analysis 4 Q.H.
(Prereq. 21.100 or permission of instructor)

This course examines the application to social data of the principles of measurement, probability, measures of centrality, tests of significance, and techniques of association and correlation.

21.240 Research Methods I 4 Q.H.

(Prereq. 21.100 and 21.239, or permission of instructor)

This course introduces students to the research process through an examination of the rules of evidence in empirical research and the place of values. Students have the opportunity to learn how to design and critique types of sociological research, how to collect qualitative and quantitative data, and how to sample populations.

21.241 Research Methods II 4 Q.H.

(Prereq. 21.100, 21.239, and 21.240, or permission of instructor)

Students are required to complete the research project begun in Research Methods I; practice coding, building indexes, scaling, table construction; introduction to use of the computer.

21.242 Qualitative Research Methods 4 Q.H.

The course offers an introduction to sociological fieldwork—methods of gathering data by extended observation of and interaction with people in natural settings. Students will take

part in a series of observations designed to teach the basic skills of open-ended interviewing, observing, recording, and analyzing data. The theoretical base will be symbolic interaction.

21.243 Human Services Research and Evaluation 4 Q.H.

(Prereq. 21.239 or other statistics, 21.157, or permission of instructor)

This course covers basic issues in applied research and the evaluation of services, including attention to the purposes of evaluation, ethics, formulating questions and measuring answers, designing evaluations and planning oriented research, utilizing evaluation results, and the turbulent setting of action programs. Suitable for students majoring in human services, sociology, psychology, nursing, health education, and related fields.

21.245 Community Analysis 4 Q.H.

(Prereq. Permission of instructor or three sociology/anthropology courses)

This course explores types of human settlements, focusing on the interaction between people and their political, economic, and social environments. Topics include power structure and citizen action to influence institutions; skills in community analysis, including use of documents, survey, observation, and evaluation of needs and resources; strategies of conflict, cooperation, and negotiation to attain community and group ends.

21.246 Seminar in Urban Studies 4 Q.H.

(Prereq. 21.145 or permission of instructor)

Interdisciplinary approaches to urban studies are compared according to problem areas and research methods. Students have the opportunity to extend previous term paper projects after exposure to social action and social systemic theoretical perspectives.

21.250 Political Sociology: Who Gets What 4 Q.H.

(Prereq. Permission of instructor or four sociology/anthropology courses)

This course offers an examination of formal political structures and informal quasi-political groups. Topics include sociological analysis of ideology, class politics, mass movements, and the conflict of various social and economic groups as they vie for political power and influence.

21.255 Organizations and Bureaucracy 4 Q.H.
(Formerly Administration and Formal Organizations: People, Machines, and Bureaucracies)

This course examines the theory of formal organization and the processes of organizational power and change in a variety of settings: industry, federal government, military, unions, co-ops, social services. We will look at the influence of bureaucracy in American society, and how

people creatively respond to, change, and democratize large organizations.

21.256 Comparative Human Services I 6 Q.H.
This course offers an intensive look at the American human services system. The course is designed to afford upper-level undergraduate and graduate students the opportunity to study the origins, development, and present state of human services in the United States. The course involves lectures as well as field visits in the Boston area. In addition to the normal classroom activities, independent study is provided.

21.257 Comparative Human Services II 6 Q.H.
This course offers an intensive study of the British human services system. This course provides students the opportunity to immerse themselves in the social and cultural context of British human services and involves field trips in London designed to examine firsthand the planning, administration, and delivery of human services in Great Britain.

21.260 Social Stratification: Class, Status, and Power 4 Q.H.
(Prereq. Permission of instructor or four sociology/anthropology courses)

Topics include theories of social inequality, concepts of social class, aspects of status and role difference, criteria for social mobility.

21.265 Sociology of Occupations and Professions 4 Q.H.
(Prereq. Permission of instructor or four sociology/anthropology courses)

Topics include the meanings of work; division of labor and specialization; analysis of occupational structure and patterns of recruitment, training, and career preferences; the classic professions and new trends in professionalization.

21.270 Class, Power, and Social Change 4 Q.H.
(Prereq. 21.200 and junior or senior standing in sociology/anthropology or permission of instructor)

The course focuses on theories of social equality and inequality as applied to the exercise of power and the growth and development of social movements and group conflict as seen from the point of view of large-scale social change. *Required of majors.*

21.280 Classical Social Thought 4 Q.H.
(Prereq. Three sociology/anthropology courses)
The course examines the development of sociology from the history of social thought. The emergence of several schools, beginning with positivistic organicism and conflict theory.

21.281 Current Social Thought 4 Q.H.
(Prereq. Three sociology/anthropology courses)
A seminar-lecture course in which formalism, social behaviorism, social action theory, and functionalism are studied critically.

21.282 Female Perspectives on Society 4 Q.H.
(Formerly *Feminist Perspectives on Society*)
(Prereq. 93.131 or equiv., or permission of instructor)

This course examines a sampling of the burgeoning feminist literature in the social sciences and in theory, focusing on at least three major tendencies in this literature: radical feminism, socialist feminism, and neo-Freudian feminism. Specific topics include the origins and/or universality of women's oppression; women's work under capitalism; socialism and women's liberation; and family structure and the reproduction of gender.

21.287 Senior Seminar 4 Q.H.
(Prereq. Senior standing in sociology/anthropology or permission of instructor)

The course provides the opportunity to analyze, from sociological perspectives, student experience in work and voluntary service and to develop and extend research interests related to that work or action experience.

21.288, 21.289, 21.290, 21.291
Directed Study (each) 4 Q.H.
(Prereq. Junior or senior standing in sociology or permission of instructor)

The course offers independent work on a chosen topic under the direction of members of the Department. Limited to qualified students with approval of department chairperson.

21.292 Seminar in Current Emphases in Sociology: Writing and Talking in Sociology 4 Q.H.

(Prereq. Junior or senior standing in sociology/anthropology or permission of instructor)

The class considers prevailing modes of presentation in major journals and verbal presentation in teaching, consulting, etc. Class members are required to submit examples of their own writing for analysis.

21.293 Seminar in Current Emphases in Sociology 4 Q.H.
(Prereq. Junior or senior standing in sociology/anthropology or permission of instructor)

This course offers review and discussion of selected sociological topics.

21.295, 21.296, 21.297, 21.298 Junior-Senior Honors Program (each) 4 Q.H.
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

93.120 An Analysis of American Racism 4 Q.H.
This is a seminar in contemporary aspects of racism in America. The cycle of racism in our institutions helping to form our attitudes and of our attitudes, in turn, shaping our institutions is studied and discussed. Emphasis is on the prac-

tical, day-to-day aspects of racism, rather than the theoretical and historical.

93.130 Professional Practices: Individual & Social Dimensions.

4 Q.H.

The course explores the dimensions and dilemmas of freedom and responsibility confronting professional people practicing within limits set by socio-economic conditions, by clients, and by other professionals. Case histories are examined to illustrate the dilemmas professionals face, the choices that are typically made, and the consequences these have on the freedom of the practitioner, and on personal and professional integrity.

93.131 Introduction to Women Studies:

Image, Myth, and Reality

4 Q.H.

This is an introductory course in the study of women in society, encompassing the historical,

political, economic, and social processes that have created both the image and the reality of women in contemporary society. The course offers an overview of the many different disciplinary approaches to the study of women.

93.204 Health Professions: Past, Present, and Future

4 Q.H.

This course focuses on social history of the modern health professions. The course explores long-range patterns in the organization and regulation of the health professions, beginning with the Middle Ages and emphasizing the Jacksonian period, industrialization, modern professional organizations, the growing role of the state, responses of the health professions, and the future of health care in the United States under various corporate/government schemes for reorganization and "accountability."

Political Science

22.110 Introduction to Politics

4 Q.H.

This course offers a broad-based introduction to contemporary political science. Areas covered include a consideration of basic concepts in political analysis (e.g., power, authority, and sovereignty); the role of governmental institutions in the making of public policy; public opinion and processes of political representation; contemporary political ideologies; and the scope and methods of political science.

22.111 Introduction to American Government

4 Q.H.

The course provides an analysis of the American governmental and political processes by focusing on constitutionalism, liberties, institutions, and political behavior.

22.112 Introduction to International Relations

4 Q.H.

The course focuses on elements of international relations, including sovereign power, and limitations on the behavior of nation-states. International law, diplomacy, the politics of international economic relations, and contemporary problems in international relations—peace and war, the arms race, detente, human rights, technology, population, and neo-imperialism, will be covered.

22.113 Introduction to Foreign Governments and Societies

4 Q.H.

(Formerly Introduction to Comparative Government)

The course offers a comparative study of parliamentary democracy in Western Europe; Communist totalitarianism in the Soviet Union, China, and Eastern Europe; and variations of these governmental systems in the "third world" countries of Asia, Africa, and the Middle East.

22.120 Conceptual Foundations of Contemporary Political Analyses

4 Q.H.

The course provides an introduction to the conceptual problems associated with the study of politics, including scientific method and a general overview of various methodological perspectives (i.e., systems theory, game theory, and survey analysis) as practiced by contemporary political scientists.

22.121 Research Methods I

4 Q.H.

The course offers an introduction to the principal quantitative methods used in political analysis, public administration, political behavior, international relations, and policy sciences. Emphasis is on basic statistical techniques, survey methods, and SPSS programming.

22.122 Research Methods II

4 Q.H.

(Prereq. 22.121)

This is an intermediate course in quantitative analytic techniques with emphasis on practical problem solving in areas of concentration, particularly political behavior, policy sciences, public administration, and international relations. Includes intermediate statistical techniques such as multivariate analysis and causal modelling, using SPSS and drawing upon machine-readable data.

22.129 Politics and Violence in Northern Ireland

4 Q.H.

This course will analyze the causes of violence in Northern Ireland. Although historical, sociological, and economic roots of the conflict will be considered, the major focus will be on politics. The international dimension (the roles of southern Ireland, the U.S., etc.), paramilitary organizations, legal political parties and groups,

and potential solutions will be discussed. Comparative parallels will be drawn, including possible lessons for the U.S.

22.130 Politics and the Mass Media 4 Q.H.

This course analyzes several facets of the mass media: the role of newspapers, radio, and television in public opinion formation; their use and effectiveness in political campaigns; their objectivity and/or bias in reporting the news; their impact on political parties and the distribution of power between Congress and the President.

22.132 Political Behavior 4 Q.H.
(Prereq. 22.110)

This course examines selected topics in contemporary political science from a political behavior perspective. Topics include political attitude formation and change, ideology, socialization, public opinion and voting behavior, political campaigning, political violence, and empirical democratic theory.

22.133 Political Parties and Pressure Groups 4 Q.H.

An analysis of political parties and pressure groups in the American political system, with attention given to policy making, elections, voting behavior, and state and national political trends.

22.134 The American Presidency 4 Q.H.

This course examines the presidential electoral process and the constitutional and extraconstitutional powers of the American President. It studies presidential leadership styles and analyzes the relationship between the executive branch and Congress, the Court, the bureaucracy, and the media.

22.135 American Constitutional Law 4 Q.H.
(Prereq. 22.111 and junior or senior status)

Employing excerpts of United States Supreme Court decisions and other reading materials, this course attempts an analysis of some of the theoretical, structural, and substantive issues inherent in and relevant to the American Constitutional system.

22.136 American Legislative Process 4 Q.H.

This course offers a study of national and state legislative structure, function, and behavior. It examines Congress and various state legislatures as policy-making bodies and assesses their impact and importance in the political system.

22.137 Civil Liberties 4 Q.H.
(Prereq. 22.136 and junior or senior status)

Employing United States Supreme Court decisions and other reading material, this course examines the substantive and procedural guarantees of the Bill of Rights and the Fourteenth Amendment and their relation to a liberal democratic society.

22.139 American Ideology 4 Q.H.

An analysis of the main American ideologies, including liberalism, neoliberalism, conservatism, neoconservatism, nationalism, etc. Examination of the historic roots of each ideology and its impact on American politics. An attempt to understand the on-going interaction of political ideology and the political process in contemporary American society.

22.141 State and Local Government 4 Q.H.
(Prereq. 22.111)

This course introduces students to the political and administrative context of state and local government and surveys the structure, function, and politics of states and localities within the context of the United States Federal system. (Public Administration elective)

22.143 Urban Politics 4 Q.H.

The course provides an analysis of the political, administrative, economic, and social dynamics of urban areas from a historical perspective. (Public Administration elective)

22.144 Housing and Community Development 4 Q.H.

The course offers a review of historical metropolitan growth patterns and the influence of public policy on the development of American cities. Topics such as urban renewal, suburbanization of low- and moderate-income housing and new communities are discussed. (Public Administration elective)

22.146 Practical Politics 4 Q.H.
(Prereq. 22.111)

This course is designed to accentuate and systematically treat some of the problems of organizing for effective citizen action, partisan and nonpartisan, at the grass-roots level. An exploration of roles in political campaigning.

22.148 Sex Roles in American Politics 4 Q.H.

The course explores the relation between what is and what ought to be—and why—in the roles of women in American politics. Topics include the traditional roles of women in politics, the suffrage movement, the woman as citizen and voter, the role of sex in achieving power and in political efficacy, and the place of women in "new politics." Political action to promote women's issues and modern feminism will also be covered.

22.153 European Parliamentary Systems 4 Q.H.
(Prereq. 22.113)

The course offers a comparative analysis of political culture, federal and unitary forms of government, and executive-legislative relations on the national level in England, France, and West Germany.

22.154 Arab-Israeli Conflict 4 Q.H.

The Arab-Israeli confrontation has its own dynamics, and its nature has changed through

the decades. This course analyzes its interaction with the internal politics of the Arab states and Israel, Pan-Arab politics, and the role of the great powers in the region.

22.155 European Political Parties 4 Q.H.
(Prereq. 22.113)

The focus of this course is on political party organization and voter behavior in England, France, and Germany, with emphasis on party ideologies, strategies, campaigns, and elections, as well as socialization. Recruitment, and participation of voters in the political process.

22.160 The Politics of Poverty 4 Q.H.

This course is concerned with what is referred to as the poverty system: how and why there is poverty, how it affects people's lives, and how it can be eliminated. As a discussion-centered course, relying also on simulations, small group work, and experience-based learning, it examines the relations between poverty, racism and the economic, political, and administrative systems. A number of alternatives will be evaluated and an opportunity provided for clarifying individual assumptions and feelings about poverty.

22.167 Techniques and Practices of Public Management 4 Q.H.
(Prereq. 22.261)

This course is oriented toward practical skills and techniques of public management and employs the case method in examining typical management problems at different levels of government. Time and resource management for public sector managerial personnel is also covered.

22.168 Human Services Administration 4 Q.H.

The ways in which human services are provided by the political, economic, and bureaucratic systems to low-income citizens are studied. The course is designed to help students develop knowledge of the public policy process, human services organizations, and delivery systems, and awareness of their values and potential as human services professionals. A discussion-based course for students interested in human services. (Public Administration elective)

22.171 Law and Society 4 Q.H.
(Prereq. Open only to upperclass, nonpolitical-science majors.)

This course examines the theory and practice of the American legal process and its impact on values. Also an analysis of the impact on these values of the military-industrial-technological complex.

22.173 Politics and Economic Problems 4 Q.H.
(Prereq. 22.111 or 22.177)

The course offers a survey of the relation between economic developments and political processes in the United States. Among the topics considered are government planning of the economy, monopoly and government regula-

tion, government programs to promote social welfare, and the impact of Federalism on the political-economic system.

22.175 Current Political Issues 4 Q.H.

The course provides an analysis of the constitutional and political background of selected contemporary public issues. Primarily for non-political science majors.

22.177 American Political Process 4 Q.H.

The course offers a general analysis of the American political system with emphasis on the topic of civil liberties. Not open to political science majors or anyone who has taken 22.111, Introduction to American Government.

22.178 The Politics of the Criminal Justice System 4 Q.H.

(Prereq. 22.111 or 22.177)

This course focuses on the criminal justice system from arrest by police to appeal to the Supreme Court of the United States. The roles of police, lawyers, judges, prosecutors, juries, and correction officers are examined.

22.179 World Politics 4 Q.H.

The course examines political continuum and change in the international system by observing both traditional actors, such as nation-state, and modern actors, such as multinational corporations, in relation to their goals and the means each uses to attain them. Primarily for non-political science majors; not open to anyone who has taken 22.112, Introduction to International Relations.

22.183 Comparative Public Administration 4 Q.H.

The course provides a comparative study of the approaches to public administration in selected democratic governments in the United States and Europe.

22.219 Eurocommunism 4 Q.H.

This course presents a study of the domestic and foreign policies of the Spanish, French, and Italian communist parties with special attention to their relations with the international communist movement.

22.220 The Politics of Imperialism 4 Q.H.
(Prereq. 22.112)

The course focuses on the political dynamics of penetration of foreign economies and foreign politics, considering such elements as military intervention, foreign aid, and the impact of the multinational corporations.

22.223 American Foreign Policy 4 Q.H.

The course examines formulation and conduct of foreign policy; role of the United States in politics since 1945.

22.225 Soviet Government 4 Q.H.
(Prereq. 22.113)

The course offers a study of Soviet political origins and behavior, with emphasis on recent changes in the party and state apparatus, the economy, and the administration of justice.

22.226 Soviet Foreign Policy 4 Q.H.

The course focuses on the evolution of Soviet foreign policy since 1917, with emphasis on the development of the international Communist movement and the onset of the East-West ideological conflict.

22.227 Communism in Eastern Europe 4 Q.H.
(Prereq. 22.113)

The course focuses on the Communist governments of Eastern Europe, with emphasis on their growing independence from Soviet Russia. Recent political change, economic liberalization, and new orientation in foreign policy.

22.228 Government and Politics in Africa 4 Q.H.
(Prereq. 22.113)

Topics include the governmental systems, political parties, socioeconomic problems, and foreign policies of selected states north and south of the Sahara.

22.231 International Organization 4 Q.H.
(Prereq. 22.112)

The course focuses on development of international organizations with special emphasis on the United Nations system. (Public Administration elective)

22.232 Political Polling and Survey Research 4 Q.H.
(Prereq. 22.121)

Survey research is the most common approach to program evaluation. This course involves an examination of the entire survey research process, including survey design, sampling, questionnaire design, survey administration, data processing, and data analysis. Some statistical analysis will also be involved.

22.233 International Law 4 Q.H.
(Prereq. 22.112)

Topics include territory and jurisdiction of states, treaties, recognition, peaceful settlement of disputes, resort to force.

22.235 Law and Personal Morality 4 Q.H.

An examination of the use of political power to enforce standards of personal morality and behavior in contemporary American society. Subjects considered will include pornography, sexual privacy and expression, Sunday closing laws, abortion, and prostitution.

22.236 Women in Public Management 4 Q.H.
Examination of the challenges and problems commonly experienced by female managers working in complex, public sector organizations. Emphasis will be placed on strategies for alleviating such problems. Special attention will be focused on career development for women in managerial roles.

22.238 Ethnic Conflict in International Perspective 4 Q.H.

The course offers a comparative study of ethnic conflict, with its religious, linguistic, racial, and economic roots in such places as Nigeria,

Cyprus, Canada, Northern Ireland, Belgium, and the United States. World order implications and Great Power consequences of such confrontations will also be studied.

22.240 Totalitarianism and Dictatorship 4 Q.H.
(Prereq. 22.113)

The course presents an analysis of totalitarianism, dictatorship, and autocracy, including study of historical background, characteristics, theories of origin, nature, and significance; evaluation of techniques, ideologies (e.g., Marxism-Leninism), policies, and institutions. Particular attention is given to Soviet and German experiences.

22.242 The Politics of Revolution and Change 4 Q.H.
(Prereq. 22.113)

The course offers an analysis of revolution and change, contemporary and historical, with attention to both theory and practice. Topics discussed include major trends in contemporary politics and society, and the relationship between political change and technological, scientific, or social change.

22.243 Government and Politics of China 4 Q.H.
Topics include government and party organization, socio-economic problems and policies, concentrating attention on the influence of history, technology, and ideology as determinants of attitudes and behavior.

22.244 China's Foreign Relations 4 Q.H.
The course examines China's traditional view of international relations and its modification first by contact with the West and later by Marxism-Leninism. The course investigates China's role in changing the international system to accord more with its perspectives on sovereignty and equality and the principles of socialist internationalism.

22.245 The Politics and Policies of Developing Nations 4 Q.H.

The course presents a survey of recent political and related change among third-world countries of Africa, Latin America, and Asia. Topics included are the heritage of colonialism and achievement of independence, the realities of cultural pluralism, revolution and political violence, institution building, political leadership and role of ideology, political parties, the military in politics, and the international aspects of political modernization.

22.247 Government and Politics of Latin America 4 Q.H.

The governmental systems, political parties, socioeconomic problems and foreign policies of Latin American states. Focus will be on political change.

22.250 Government and Politics of Japan 4 Q.H.
(Prereq. 22.112 or 22.113)

Examines Japan's political development from the Meiji Restoration to the present, exploring the unique form of democratic government prac-

ticed in Japan and evaluating the effects of Japanese political theory, war, the American occupation, the Emperor, and Japanese political and cultural values on Japan's political institutions. Japan's present and future impact on the international system is also considered.

22.257 Government and Politics in the Middle East 4 Q.H.

Approaches the political, economic, military, and ideological factors within the Arab states and Israel, inter-Arab politics, the Arab-Israeli conflict, and the great power rivalry in the region.

22.259 Political Development in Revolutionary Societies 4 Q.H.

(Prereq. 22.112 or 22.113)

Examination of political development in selected revolutionary societies, including Cuba.

22.260 Public Policy Analysis 4 Q.H.

An analysis and evaluation of public policy in the United States.

22.261 Public Administration 4 Q.H.

(Prereq. 22.111)

Introduction to the theory and practice of public administration, with special emphasis on the generalities of institutions, processes, and behavior of bureaucratic organizations.

22.262 Organization Theory 4 Q.H.

Provides a broad overview of organization theories, their history, and development. Specific attention is given to developing a paradigm for public organizations that focuses on the relationships of economic, democratic, bureaucratic, technological, and humanistic imperatives. The student will prepare a research paper and consider the implications of this paradigm for future organizations.

22.263 Public Management 4 Q.H.

(Prereq. 22.261)

What problems are entailed in the management of public agencies? How do public managers seek to solve these problems? These questions are explored through the use of descriptive, analytical, and case materials. (Public Administration elective)

22.266 Public Personnel Administration 4 Q.H.

(Prereq. 22.261)

Designed to be an overall introduction to the field of public personnel administration. It includes examination of selected topics such as recruitment, selection, classification, care development, equal opportunity, public employee unionism and collective bargaining.

22.267 Public Budgeting 4 Q.H.

(Prereq. 22.261)

Focuses on the function of budgeting in a variety of governmental contexts, specifically, the appropriations process, the budget as a management tool, and the public policy impacts of the budget. Budgeting techniques are emphasized within this context.

22.269 Governmental Accounting 4 Q.H.

(Prereq. 22.261)

Basic accounting principles and methods used by government agencies including the utilization and interpretation of financial statements, auditing, and the application of electronic data processing in government record keeping. (Public Administration elective)

22.270 Political Theory 4 Q.H.

(Prereq. Junior or senior status or consent)

An analytic approach to the study of key political concepts: power, equality, freedom, authority, obligation, ethics, law, rights, punishment, state, sovereignty.

22.273 Political Thought I 4 Q.H.

(Prereq. Junior status or permission of instructor)

An analytical and historical examination of the great political thinkers and the main trends of political thought from the Grecian age to the Renaissance.

22.274 Political Thought II 4 Q.H.

(Prereq. 22.273)

An analytical and historical examination of the great political thinkers and the main trends in political thought from the Renaissance to the twentieth century.

22.276 American Political Thought 4 Q.H.

The contributions to political theory of the main social, economic, political, intellectual, and philosophic movements in America from the colonial period to the present.

22.278 Contemporary Political Thought 4 Q.H.

Analysis of current ideals, ideologies, and political movements, including existentialism, neo-Marxism, black power, women's liberation. The decline of ideology and behavioralism.

22.282 Seminar in American Government 4 Q.H.

(Prereq. Senior political science major and permission of instructor)

An in-depth study of selected topics in American government.

22.283 Seminar in International Relations 4 Q.H.

(Prereq. Senior political science major and permission of instructor)

This course offers an in-depth study of selected topics in international relations.

22.284 Seminar in Comparative Politics 4 Q.H.

(Prereq. Senior political science major and permission of instructor)

This course offers an in-depth study of selected topics in comparative politics.

22.285 Senior Seminar in Political Science 4 Q.H.

(Prereq. Senior political science major)

This course offers an in-depth study of selected topics in political science.

22.286 Internship 4 Q.H.

With Department approval, students may be eligible to receive credit for internship ex-

perience. An internship is under the supervision of a faculty member.

22.288 Seminar in Public Law and Social Issues

(Prereq. Junior or senior status and permission of instructor) **4 Q.H.**

This course examines some of the continuing and perplexing social problems through the media of legal writings and recent court cases. Issues to be discussed include abortion, euthanasia, family planning, criticism of public officials, political activism, the right of privacy, obscenity, racial and economic discrimination.

22.290, 22.291, 22.292 Directed Study

(each) **4 Q.H.**

This course offers independent work on chosen topics under the direction of members of the Department and is limited to qualified juniors and seniors with approval of instructor.

22.295, 22.296, 22.297, 22.298 Junior-Senior Honors Program

(each) **4 Q.H.**

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 00.

22.299 Practicum in Lobbying

4 Q.H.

This is a field work course in which students will become involved in supervised lobbying activity on the national or state level of politics.

History

23.101 Western Civilization

4 Q.H.

This course explores the major ideas and institutions of Western Civilization from ancient times to 1648.

23.102 Western Civilization

4 Q.H.

A continuation of 23.101, covering the period since 1648.

23.108 Hitler's Germany (Group B)

4 Q.H.

This course offers a study of the origins and nature of Hitler's Third Reich, emphasizing the personal lives of Nazi leaders in an attempt to understand how seemingly ordinary people could enthusiastically promote wars of aggression and revel in genocidal policies.

23.109 Population in European History

(Group A or B)

4 Q.H.

This course provides an application of the principles of demography to European history from Roman times to the present, with attention to the interaction of birth, death, marriage, and migration rates with climate change, epidemic disease, war, economic developments, social upheaval, and political policy.

23.111 Ancient Greece (Group A)

4 Q.H.

Topics include the origins and development of Greek civilization; political evolution of Hellenic society from tribal to city-state organization; growth and application of Greek religious, political, and ethical ideas.

23.112 Ancient Rome (Group A)

4 Q.H.

This course examines Roman civilization in two sequences: 1) the rise of Roman power under the Republic and 2) the decline of Roman power under the Empire.

23.115 Medieval Europe (Group A)

4 Q.H.

Topics include Europe from the barbarian invasions to the late thirteenth century; the expansion of Christianity and the institutionalization of church and papacy; the emergence of the Holy Roman Empire, England, and France as political units; social, cultural, and economic developments.

23.116 Europe in the Age of the Renaissance

(Group A)

4 Q.H.

The course focuses on Europe from 1300 to 1500, when alternatives to medieval institutions became increasingly apparent. Special attention to political, economic, and cultural changes in Italy and northern Europe.

23.119 Europe in the Age of Reformation

(Group A)

4 Q.H.

Political, economic, social, and religious background of the Protestant and Catholic Reformations from 1500 to 1660. Emphasis also on the impact of the Reformation on Europe.

23.122 Europe, 1870-1921 (Group B)

4 Q.H.

The course focuses on Europe from the Franco-Prussian War to the post-World War I settlement: the growing tensions and rivalries and the declining certainties of the end of the nineteenth century, the origins of World War I, the War itself, the Russian Revolution, and the Peace of Paris.

23.123 Europe since 1921 (Group B)

4 Q.H.

The course focuses on Europe from the Versailles Settlement: the rise of totalitarianism, the Depression, the crises of liberalism and of the European mind, the Appeasement Era, World War II, the Cold War, the end of colonialism, and Europe today.

23.127 The French Revolution and Napoleon

(Group B)

4 Q.H.

The course examines the history of France in the age of the *ancien regime* and the Enlightenment as background for the French Revolution and Napoleon.

23.128 Modern France (Group B)

4 Q.H.

A survey of the chief political, social, economic, intellectual, and cultural developments of France from the Revolution to the present.

23.130 England to 1688 (Group A)

4 Q.H.

Topics include prehistoric Britain, the Anglo-Saxons, the Normans, the Plantagenets, the Tudors, and the Stuarts, with emphasis on the

development of parliamentary institutions until the Glorious Revolution.

23.131 England since 1688 (Group B) 4 Q.H.

The course focuses on England from the Glorious Revolution to the present, with emphasis on the development of Parliament, the Industrial Revolution, nineteenth-century reaction and reform, the World Wars, and the rise of socialism.

23.134 Tudor England (Group A) 4 Q.H.

This course offers a study of England from the late fifteenth to the early seventeenth century. Topics include an examination of the Tudor contribution to the development of political and social institutions; the Protestant Reformation and the relation between religion and politics; social and economic changes and their relation to the Elizabethan Renaissance. Particular emphasis is placed on intellectual and cultural developments and England's relation to Europe and the New World.

23.135 Victorian England (Group B) 4 Q.H.

The economic, social, and political life of the English people during Victoria's reign.

23.137 The Decline of Great Britain

(Group B) 4 Q.H.

The economic, social, and political life of the English people in the twentieth century.

23.138 Irish Civilization (Group B) 4 Q.H.

The course examines the history of Irish civilization from the earliest heroic sagas and their impact on Irish values to the Irish independence movement, the prototype and model for many other twentieth-century liberation movements.

23.139 History of Modern Italy (Group B) 4 Q.H.

The course offers a survey of the social, economic, and political development of the modern Italian state from the seventeenth century to the present. Emphasis on the problem of modernization.

23.140 Imperial Russia (Group B) 4 Q.H.

The course focuses on the emergence of Russia as a recognized European power, westernization and expansion in the eighteenth century, the impact of Napoleon, reform and revolution.

23.141 Soviet Russia (Group B) 4 Q.H.

The course examines forces molding the history of Russia since 1917, internal developments, and foreign relations.

23.142 Islam Resurgent (Group D) 4 Q.H.

An analysis of what has been called "the militant revival of Islam" as a rallying point for reformist or revolutionary movements in the Muslim world. The course will include little-known Muslim areas outside the Middle East in Africa and Asia.

23.145 The Modern Middle East (Group D) 4 Q.H.

Focus of this course is on the Middle East since 1800, with emphasis on the background of present problems.

23.146 Contemporary Middle East

(Group D) 4 Q.H.

The course focuses on political, economic, and social developments in the Middle East since the end of World War II.

23.149 Imperialism (Group B) 4 Q.H.

The course examines the rise and fall of the European colonial empires with an emphasis on the period of the late eighteenth to the twentieth century. Attention is given to theories underlying imperial expansion and the impact of imperialism on colonies and colonizers.

23.155 Introduction to Third World History

(Group D) 4 Q.H.

A survey of the history of the leading nations in Asia and Africa from early civilizations through twentieth century independence movements and international relations.

23.157 The Middle East Today in Fact, Fiction, and Film (Group D) 4 Q.H.

A study of social, economic, and political changes and conflict in the lives of ordinary people who have been experiencing the recent crises reported in the media. The course will focus on common experiences among various peoples—Turks, Armenians, Israelis, Arabs, and Iranians—and will emphasize significant themes: lifestyles, generational conflict, the changing role of women, ethnic or ideological conflict, and the prevalence of identity crises attending cultural and social disruption.

23.160 History of Science and Technology

(Group A or B) 4 Q.H.

The course offers an interdisciplinary survey of the development of science and technology, integrating theories of the philosophy and sociology of science within a historical framework. Emphasis is placed on the environmental and ideological conditions that contribute to the birth and growth of the various sciences and to the relation between these conditions and technological innovation.

23.162 Technological Transformations of Society (Groups B, C, D) 4 Q.H.

The relation between technological innovations and the world in which they take place. Discussion of conditions necessary for discovery and innovation. Impact of technology on political, economic, and social environments.

23.163 Capitalists and Capitalism

(Group B or C) 4 Q.H.

This course provides an examination of capitalism from the Renaissance to the present with attention to the role of major individual capitalists like the Rothschilds, Krupps, and Rockefellers, and to the impact of great historical forces like war, the Protestant Reformation, and imperialism.

23.165 The Family in European History**(Group B)****4 Q.H.**

The course offers an examination of issues in the history of the European family from the late Middle Ages to the present. Topics include marriage and sexuality, child-rearing practices, the effect of industrialization and revolution on family life, the Victorian family, and the evolution of the modern family. Students will prepare their own family histories.

23.168 The Culture of Europe (Group B)**4 Q.H.****(Formerly The Creative Matrix)**

The course provides an analysis of the culture of the West in the nineteenth and twentieth centuries, focusing on the conjunction of social, cultural, and psychological forces that encouraged or retarded creativity. Attempts will be made to show the interconnections among the arts, social sciences, and sciences within each of the periods covered.

23.168 Class, Love, and Power in Western Europe (Group B)**4 Q.H.**

The course provides an examination of social change in Europe since 1800 with emphasis on the interaction of industrialization, class movements, demographic trends, and revolutionary upheavals.

23.172 Recent Leaders of Asia (Group D)**4 Q.H.**

The course focuses on the lives and roles of recent leaders of Japan, China, India, and other Asiatic countries.

23.173 China since 1850 (Group D)**4 Q.H.**

The course focuses on the history of China from the Opium War to the present, with emphasis on the concepts and policies of the Communist regime since 1949.

23.174 Japan since 1850 (Group D)**4 Q.H.**

The course examines the history of Japan since its opening by the West. Emphasis on westernization, the rise of Japan as a world power, and the Japanese experience since the defeat in World War II.

23.175 Communist China (Group D)**4 Q.H.**

Focus of this course is a close look at the policies and achievements of China since the communists won control in 1949. The major emphasis is upon the background for communist victory, the unique vision of Mao Zedong and his prescriptions for China, and the radical changes since Mao's death and the arrest of the "Gang of Four."

23.176 European Urban History to 1850**(Group A or B)****4 Q.H.**

A review of urban development from the Greeks through the emergence of the industrial cities of nineteenth-century Europe. Individual cities such as Rome, Paris, and London are given special study.

23.178 Health and Sickness: Historical Perspectives (Group A, B, C, or D)**4 Q.H.**

A survey of medical theories and the health care systems derived from them, from ancient times to the present. Medical theory and practice as related both to the general history of the time and to the particular political, economic, or social circumstances that influenced institutions for health care.

23.182 Modern Western Economic History (Group B)**4 Q.H.**

The course provides a survey of the development of the Western world examined within the framework of economic theory, with attention to social and political ramifications.

23.184 Communism and Revolution**(Group B)****4 Q.H.**

The course focuses on the history of socialism and revolution from the early nineteenth-century utopias to the New Left of the 1960s.

23.185 Revolutions (Group A or B)**4 Q.H.**

This course provides a review of the important theories of revolution and an analysis of the major early modern and modern revolutions, with a view to evolving a working theory of both political and generational revolutions for the twentieth century.

23.186 War in the Twentieth Century**(Group B, C, or D)****4 Q.H.**

The course provides an analysis of the causes, prosecutions, and effects of the major wars fought in the twentieth century. The course concentrates on the First and Second World Wars and on the Vietnam War. Using film, simulations, and other materials, classes explore the economic, social, cultural, and psychological impacts of these wars as well as their political, diplomatic, and material aspects.

23.188 History and Film (Group B or C)**4 Q.H.***

The course offers an exploration of various historical issues as seen through the eyes of historians and filmmakers. Both acted and documentary films are shown in combination with readings from a variety of source and interpretive materials.

23.195 Advanced Western Civilization**4 Q.H.****(Prereq. Invitation of instructor of 23.101)**

Students who demonstrate mastery of 23.101 through consistently superior work may be invited to work on an individual basis with their instructor. Together they will work out projects relating to the course.

23.196 Advanced Western Civilization**4 Q.H.****(Prereq. Invitation of instructor of 23.102)**

Similar to 23.195 in relation to 23.102.

23.197 Women in European History to 1815 (Group A or B)**4 Q.H.**

This course offers an examination of changing sex roles from the early Christian era through

the eighteenth century and an assessment of their significance within the social and political context of pre-industrial Europe. Topics include society's attitudes toward the sexes; family structure and marriage patterns; and male and female roles in economic life and in religious and political movements.

23.199 The Historian's Craft 4 Q.H.

The ways in which the historian studies the past and the nature of historical statements are examined. Problems considered include research techniques, changing conceptions of historical knowledge, and the relation between the historian and the society in which he works.

**23.200 Social Science Methodology 4 Q.H.
(Formerly Interdisciplinary Methods)**

The course offers an introduction to social science methodology and quantitative techniques used in historical analysis.

23.201 Colonial America (Group C) 4 Q.H.

The course covers the discovery and exploration of the New World, the settlement of the English colonies on the North American mainland, their development to 1763, and the origin of their clash with England.

23.202 The American Revolution (Group C) 4 Q.H.

The course focuses on the coming of the American Revolution, its nature and progress, and its political, economic, and social aftermath.

23.203 Crime and Punishment: A History of the Criminal Justice System in America (Group C) 4 Q.H.

The course examines the evolution of the criminal justice system in the United States, with special emphasis on the impact of English common law, the changing role of law enforcement officers, reform movements, the female offender, the black experience, and the changing meaning of law and order in the United States.

23.204 Total Institutions and the Individual: An Interdisciplinary Approach (Group C) 4 Q.H.

Using the tools of history, psychology, and sociology, this course examines the varying effects that total institutions (such as prisons, asylums, concentration camps, and the American slave plantation) have had on the human personality. An effort is made to develop a clearer understanding of how the human personality responds to such environments and of their stigmatic effects on the individual.

23.207 History of the Professions (Group C) 4 Q.H.

The course examines the evolution of the classic professions of law and medicine in the nineteenth century and the emergence of new professions in engineering, nursing, accounting, and social work. Themes include professional-client, professional-employer, and professional-governmental relations as well as education,

professional organizations, and sex-stereotyping.

23.210 The United States to 1877 4 Q.H.

The course focuses on the history of the American people from 1763 to 1877, with an analysis of the American Revolution and the major political, constitutional, diplomatic, economic, and social problems of the new nation.

23.211 The United States since 1877 4 Q.H.

The course offers a continuation of the survey of American history, with discussion of the emergence of an industrial economy, an urban society, world responsibility, and expanded federal government.

23.212 Topics in American History (Group C) 4 Q.H.

Special topics in the history of the people of the United States from 1789 to the present.

23.213 American Urban History (Group C) 4 Q.H.

The course examines the development of urban society in the United States in the nineteenth and twentieth centuries, with emphasis on the effects of immigration and industrialization upon the politics, thought, and society of American cities.

23.214 History of Sport in America (Group C) 4 Q.H.

The course provides a history of the major sports and their impact on American life.

23.216 American Reformers and Reform Movements (Group C) 4 Q.H.

The course provides an analysis of American reform, especially in the nineteenth century.

23.218 The Civil War and Reconstruction (Group C) 4 Q.H.

The course focuses on the Civil War, its coming, its nature and progress, and the aftermath of Reconstruction.

23.220 The United States, 1890-1920 (Group C) 4 Q.H.

Topics include populism, progressivism, World War I, and the reaction of the 1920s.

23.221 The United States, 1920-1945 (Group C) 4 Q.H.

The course examines the Depression, the New Deal, World War II, and mid-century, emphasizing the clash between liberalism and conservatism and the movement from isolationism to interventionism.

23.222 The United States since 1945 (Group C) 4 Q.H.

The course focuses on America's diverse responses to postwar challenges of urbanization, economic change, civil rights, and Communism.

23.224 China and the United States (Group C or D) 4 Q.H.

The course offers an examination of the relations of China and the United States, including the period of the missionaries and opium traders; the era of special privileges; the Open

Door policy; the first half of the twentieth century, when China became America's favorite protegee; and the years of strain, warfare, and finally accommodation after the Chinese communists came to power in 1949.

23.230 The Westward Movement

(Group C) 4 Q.H.

The course examines America's westward movement and its impact on the political, social, and economic life of the nation.

23.233 America and the Sea (Group C) 4 Q.H.

Topics include the history of exploration and discovery of America, the development of fishing, the rise of ocean commerce, the history of the American Navy.

23.234 American Military History

(Group C) 4 Q.H.

A survey of the complex relation between American society and war, from the age of muskets to the neutron bomb.

23.235 American Diplomatic History

(Group C) 4 Q.H.

The course focuses on the formation and administration of American foreign policy from the Revolution to the present.

23.240 The Growth of Government

since 1935 (Group C) 4 Q.H.

This course offers an examination of the expansion of government in recent America and its impact on society. The size and cost of government is discussed from historical and non-American perspectives, and the evolution of welfare, taxation, management of the economy, presidential power, intergovernmental relations, and bureaucracy from Franklin Roosevelt's time are analyzed.

23.241 Topics in African-American

History (Group C) 4 Q.H.

An in-depth examination of the major topics that have shaped the African-American experience. Among the areas to be included are slavery and its effects, the role of the antebellum free Black, the Civil War and Reconstruction, Black response to the new racism of the late nineteenth century, the W.E.B. DuBois-Booker T. Washington controversy, Marcus Garvey and the shaping of twentieth-century Black nationalism, and the changing nature of the Black revolution from Martin Luther King to Malcolm X and beyond.

23.244 The History of Boston (Group C) 4 Q.H.

The history of Boston from colonial times to the present, with attention to the topographical growth and the ethnic composition of the city.

23.245 History of Massachusetts

(Group C) 4 Q.H.

This course focuses on the political, economic, social, and intellectual history of Massachusetts from the Constitution of 1780 to the present. The

impact of war, immigration, and industrialization, and the orientation and integration of Massachusetts in the Union are studied.

23.246 The Industrial Transformation of New England (Group C)

4 Q.H.

This course examines the process by which New England evolved from an agricultural to an industrial society and the effects of industry's move from the area. Field trips to historical industrial sites are planned.

23.247 History of Media in America

(Group C) 4 Q.H.

The course focuses on mass communication in American history, with special attention to the role of newspapers, magazines, books, films, radio, and television.

23.253 American Elites (Group C)

4 Q.H.

This course examines the life of elite individuals and groups in American society, especially in the nineteenth and twentieth centuries.

23.255 American Business History

(Group C) 4 Q.H.

The course examines the rise of business in America, the role of the corporation, horizontal and vertical combinations, business and labor, business and government.

23.258 Work and Leisure (Group B or C) 4 Q.H.

How we work and how we play are important determinants of how we live. This course examines the historical evolution of contemporary patterns of work and leisure across cultural, sexual, and class lines. Subjects include the impact of machine technology on the worker and the workplace; workers' organizing in unions and professional groups; changing concepts of the use of time; women's work and women's leisure; recreation and sports (both participant and spectator); and the rise of the cafe and the saloon as sociable institutions.

23.260 The American Woman (Group C) 4 Q.H.

An analysis of women's economic and social roles from the colonial period to the present is offered in this course, with special attention to women's work, their roles in family and community, and nineteenth- and twentieth-century women's rights movements.

23.265 The Automobile in America

(Group C) 4 Q.H.

The course focuses on the impact of the automobile on American society in a historical context. Topics include inquiry into the abandonment of traditional prohibitions of motorized carriages and examination of the use of planning, taxes, and highway policies to foster the use of the automobile. The effect of the car on land use, recreation, and the economy. Contemporary issues such as pollution and energy.

23.267 History of Flight and Space

(Group A, B, or C) 4 Q.H.

Beginning with the dreams of flight of the ancient Greeks and Leonardo da Vinci, the course

traces the history of nonpowered flight from the balloon experiments of the Montgolfier brothers to contemporary hanggliders: powered flight from the Wright brothers to the SST; and rocketry and space travel from its earliest beginnings to "Enterprise."

23.270 The World since 1945 (Group B) 4 Q.H.

The course offers a thematic study of issues and movements that have influenced the world's history since the end of the Second World War. Subjects include the Cold War, the end of colonialism, urbanization, technology and ecology, cultures and counter-cultures, the "global village," and the prospect for human liberation.

23.271 Third World Women (Group D) 4 Q.H.

This course provides an exploration of the role of women in the less-developed Third World areas, with special emphasis on factors of change, development, and continuity.

23.273 History of the Vietnam Wars (Group C or D) 4 Q.H.

A history of military conflict in Vietnam with attention to the rise of the Viet Minh during World War II, the struggle against the French in the first Indochina war, the impact of the Cold War, and the involvement of the United States after 1950 in Laos and Cambodia as well as Vietnam. Emphasis will be placed on the roles of communism and nationalism in Indochina and on the motives for American intervention. Films revealing American reaction to the escalating conflict will be shown.

23.279 Canadian History (Group D) 4 Q.H.

The history of Canada from the time of European settlement to the present, with emphasis on Canadian relations with the United States and on the background of the Quebec separatist movement.

23.286 Fieldwork in History I 4 Q.H.

(Prereq. 23.101, 23.102, 23.210, 23.211, and 16 Q.H. in other history courses)

This course offers directed work in historical societies, archives, museums, and other his-

torical agencies. Students should consult the Department of History for details.

23.287 Fieldwork in History II 4 Q.H.

(Prereq. 23.286)

The course offers directed work in historical societies, archives, museums, and other historical agencies. Students should consult the Department of History for details.

23.295, 23.296, 23.297 Junior-Senior Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

23.298 Approaches to History 4 Q.H.

Students will undertake a major historical project based on the application of appropriate methodologies and upon the substantive understanding of a single subject chosen by the course instructor and announced in advance of the quarter. The course is rotated among the department's faculty. All history majors are required to take this course, though it is open to all upperclass students. All students must have completed 80 quarter hours of work before taking this course.

23.299 Directed Study 4 Q.H.

93.131 Introduction to Women Studies: Image, Myth, and Reality 4 Q.H.

An introductory course in the study of women in society, this course encompasses the historical, political, economic, and social processes that have created both the image and reality of women in contemporary society, and offers an overview of the many different disciplinary approaches to the study of women.

93.164 Introduction to Irish Studies 4 Q.H.

Introduction to Irish Studies is taught from the perspective of a number of fields in one-week sequences: art, business, drama, history, literature, music, politics, and sociology. The purpose of the course is to introduce students to the important forces that have helped to shape contemporary Ireland and Irish-American culture.

African-American Studies

25.100 African-Americans in Science, Technology, and Medicine 4 Q.H.

The course studies the contributions that African-Americans have made to the development of science and technology in America. It examines the cultural and social factors that have encouraged blacks to work in the fields of science (biology, chemistry, physics) and technology (engineering and medicine). Certification of blacks within the American scientific community and the availability of science to the past and contemporary African-American community

are also explored. Readings, discussions, individual research topics, and interviews with black scientists, inventors/engineers, and doctors are used to develop the basic course material.

25.102 Education Issues and Minority Communities I 4 Q.H.

This course focuses on some of the important issues in today's urban elementary and secondary education systems. The analysis will look at the historical development of these issues, and students will be encouraged to think about and discuss their future significance.

25.136 The Economics of Urban Poverty 4 Q.H.

Like most Americans and people from around the world, blacks migrated to central cities in America to better their economic conditions. However, unlike other migrants to urban centers, they were not assimilated into the social/economic mainstream, and there is evidence of flagrant job, housing, and educational discrimination against them even during periods of affluence. During recession or depression, their problems were compounded. Students have the opportunity to survey the above events from an economic framework.

25.150 History of Blacks in the Media and the Press**4 Q.H.**

The course offers a historical and visual examination of the development of the African-American experience in the American mass media and press. Contemporary and historical literature, films, and people are a part of the study and analysis with respect to history, racism, images, psychology, and social movements. Newspapers, film, television, and radio are prime focal points, and they are used to help form strategies for the future of black Americans.

25.170 Economic Issues in Minority Communities**4 Q.H.**

Minority lifestyles, perspectives, self-images, and social position in the urban community are all affected by economic factors, especially those specific to the minority poor. Students have the opportunity to examine these issues, particularly in terms of the application of basic economic theories to the economic realities of minority communities.

25.171 Poverty and Health Care**4 Q.H.**

Why do the poor fail to get good health care? The course discusses problems of the poor and will examine the entire health care system, including Blue Cross and Blue Shield, Medicare and Medicaid, National Health Insurance, low-income barriers to health care, and future directions of medical health care.

25.178 Identity and Nationalism**In Africa****4 Q.H.**

How have centuries of imperialism, the struggle for national unity, and the continuing problems of racism and rivalry between factions affected the present identities and nationalist movements in Africa? This course explores problems peculiar to Africa and to any group of nations struggling against colonial ideas. Tribalism and the effects of European colonial partition on African identity are discussed.

25.180 Epidemiology of Black Diseases 4 Q.H.

Students are introduced to the science of epidemiology, the study of the occurrence of disease in populations. The concepts, principles, and methods of epidemiological analysis are explored with emphasis on specific diseases

occurring with greater frequency in urban and black populations, such as cardiovascular conditions, sickle cell disease, and certain occupational and environmental illnesses.

25.191 Research Seminar**4 Q.H.**

This course is divided into three parts, providing students the opportunity first, to identify a substantive area of their concern (e.g., welfare, political leadership, education) and to define a related problem in a research context; second, to be supervised in designing a research methodology most appropriate for examining the problem area; and third, to conduct extensive research, test the hypothesis, and draw conclusions based on data analysis techniques.

25.194 Field Research Seminar**4 Q.H.**

(Prereq. Permission of instructor)

Seniors have the opportunity to work with a faculty member on an individual basis, while carrying out a particular research project off-campus. Students are required to refine and polish a topic and outline for the senior thesis.

25.195 Directed Study for Senior Thesis**4 Q.H.**

(Prereq. Permission of instructor)

The senior thesis is required of all African-American Studies majors; it offers students the opportunity to prepare a professional research paper under the close supervision of a scholar interested in students' particular research areas.

25.200 Introduction to African-American Studies**4 Q.H.**

The course touches on several of the possible historical, sociological, cultural, and political avenues of study in the broad interdisciplinary spectrum of African-American Studies. It is intended to help provide an introductory overview of the field and will offer students the opportunity to identify areas for more specific focus.

25.201 African-American Literature I**4 Q.H.**

The course offers a survey of African-American literature from the period of slavery to the present, with an emphasis on literature concerning the relation between the rise of the black American and the development of African-American literature. The black experience as it is revealed in literature will be important in the discussion.

25.202 African-American Literature II**4 Q.H.**

(Prereq. 25.201 or permission of instructor)

This course continues the survey of African-American literature; its primary focus, however, is on principal writers and their major themes.

25.203 The Black Novel**4 Q.H.**

The black novelist belongs to a unique literary group in the history of American fiction. Special attention is given to Chesnutt, Toomer, Wright, Ellison, and contemporary novelists, and to their different perceptions of the black experience in America.

25.208 African Civilization I**4 Q.H.**

This course deals with the ancient empires of Africa, especially Ghana, Songhai, Mali, Zimbabwe, the city states of East Africa, and also the Congo Kingdom. Included are Ethiopian as well as Egyptian history and the controversies surrounding their histories to 1800.

25.209 African Civilization II**4 Q.H.**

(Prereq. 25.208 or permission of instructor)

This course on African civilization covers the period from 1800 to the present era. Emphasis will be placed on the relation between Europe and Africa, the circumstances surrounding the imperialist partition of Africa, and the de-colonization process.

25.210 Contemporary Issues in Black Society**4 Q.H.**

This course offers an introduction to the various issues and problems that confront black Americans, including some of the realities of the social, political, and economic problems of contemporary black experience. Students are asked to assess the validity of specific social theories in relation to the black experience.

25.211 Survey of Black Theatre and Drama**4 Q.H.**

Theatre in America has been an important reflector of the national experience, and black theatre, especially in recent years, has served the same purpose for the black community. The course focuses on the development of black drama during the nineteenth and twentieth centuries, with emphasis on modern developments and their political and cultural significance.

25.212 The Black Family**4 Q.H.**

How does the black family function, both interpersonally and as a social unit? Anthropological and sociological theories deal with variations in family structure and the function of the black family in black society. The effects of slavery and colonization on the black family structure and functions are also explored. A side issue is a discussion of some of the differences and similarities between African, African-American, and African-Caribbean families.

25.213 History of South Africa**4 Q.H.**

(Prereq. 25.209 or permission of instructor)

Initial attention is directed toward pre-colonial South Africa and the conflict between Africans and the Dutch and English settlers. The course then focuses on the formation and transformation of colonial policy after World War II, with particular emphasis on racism, neo-colonialism, liberation movements, and international involvement in the apartheid system.

25.214 History of East Africa**4 Q.H.**

The first section of the course deals with the pre-colonial period and the problems of the partition of Africa. The second section focuses on the classical colonial period and the transformations of colonial policy after World War II, with

particular emphasis on the ambiguity of de-colonization and those features of the colonial system that seem to have become a part of the East African social and political environment.

25.215 History of West Africa**4 Q.H.**

The history of West Africa has included the struggle for internal unity, economic development, and social justice. The Pan-Africanist ideology, W. E. B. DuBois's writings, African socialism, and the consolidation of power and leadership are some of the topical objectives in this study of African liberation, particularly the rise of West Africa.

25.216 The Black Experience in the Caribbean**4 Q.H.**

The course offers a descriptive and interpretive analysis of the growth of the modern black community in the Caribbean. Although the focus will be on the contemporary period, the course will examine that period in the context of colonialism and slavery in the Americas. Important racial, social, political, economic, and religious issues will be addressed.

25.218 Black Man/Black Woman**4 Q.H.**

Sociological and anthropological methods are used to examine black male and female personality development, as well as the development of black male and female behavior, self-image, sexual roles, and behavior within both the black and the white communities.

25.222 Third World Political Relations**4 Q.H.**

This course offers a comparative regional analysis of the political systems of third world nations of Africa, Asia, Latin America, and the Caribbean. Emphasis is on development strategies; problems of development, including national identity, political socialization and participation, national defense, and urbanization; and the positions of third world nations in the international community.

25.224 Black Cultural Development in the United States**4 Q.H.**

The course focuses on the rise of a distinctive black culture in the United States, with emphasis on examining the premise that the black population in America has developed a cultural system that operates as a subsystem of the American cultural norm.

25.234 Africa Today**4 Q.H.**

With increasing numbers of nations striving for economic and political control in Africa, and with imperialist and colonial ideas remaining in the living memory of Africans, Africa presents a complex political and social picture to the rest of the world. This course examines some of the salient features of black art, politics, and identity in Africa.

25.236 Religion in Black American Society**4 Q.H.**

Black life in America cannot be fully understood without a sense of the importance of religion in

the community. This course looks at the impact of religion on social structures, group behaviors, moral codes, and belief patterns in black society. Topics include the church as a social organizer, the role of the black minister in the community, and the variety of black denominations in urban and rural areas.

25.237 African-American History I 4 Q.H.
This survey covers the development of black America from the period of slavery through Reconstruction, with emphasis on the historical links between Africa and America and their impact on black development in the United States.

25.238 African-American History II 4 Q.H.
(Prereq. 25.237 or permission of instructor)
This course examines the development of black America from Reconstruction to the present, and the effects of events in the United States and world history on the development of black America. There is special emphasis on contemporary issues and how these issues can be seen through a historical perspective.

25.246 Survey of Contemporary Black Political Movements 4 Q.H.
The modern black political movements were inspired by a full-scale evolution of black political thought in America. Analysis of this evolution examines socio-political contests that have served as catalysts to these modern movements.

25.247 Racial Integration and its Impact on Education 4 Q.H.
This course offers an examination of the historical struggle for desegregation. This course analyzes current urban issues in racial integration and some of the projected effects of integration.

25.255 Public Policy Analysis 4 Q.H.
The course analyzes the dynamics of the public policy formation process at the local, national, and international levels, with particular attention to the implications of public policy for minority groups. Emphasis is placed on a critique of the policy maker's role and power in the socio-economic setting.

25.267 Black Political Behavior 4 Q.H.
The course provides an introductory examination of the social and psychological dynamics of black political participation. Main issues of the course include identity and political socialization and their impact on black voter turnout and partisan choices.

25.269 Race Relations in America 4 Q.H.
The course offers an examination of the interrelations of ethnic, cultural, and minority groups in the United States. Focus is on the nature of racial conflicts, discrimination, reverse discrimination, personal and institutional racism, and racial and ethnic stereotyping. Discussion considers avenues of improvement in attitude awareness and change.

25.270 Black Political Thought 4 Q.H.
How do the black people as a unit view the American political system and black people's chances of improving their lot in this country? This course examines black opinions, from the radical to the ultra-conservative, of the United States political system. The focus is historical in context and will address notions of political socialization and the development of black political ideologies.

25.271 Survey of African-American Art 4 Q.H.
Black art, like black literature, has always been an important aesthetic social statement by the African-American artist. This course offers a historical and critical examination of African-American art from the nineteenth century to the present, with special emphasis on the effects of European and African art styles on the black artist in America.

25.272 Analysis of Comparative Slavery 4 Q.H.
Slavery has had major psychological effects on the shaping of the black American experience, as well as on the experience of blacks throughout the world. An analysis of the sociological implications of slavery on group interrelations, social norms, and cultural aberrations covers several national versions of the slave system in Africa, Europe, the Caribbean, and North and South America.

25.273 Analysis of the Slavery System in America 4 Q.H.
This course attempts a comprehensive survey of the realities of the slavery system in America, with focus on the impact of slavery on blacks as well as on the society that perpetrated the system. Examination of slave narratives and other historical documents will provide insights into the origin of the slavery system and the way it functioned until the Emancipation Proclamation.

25.278 Black History of Boston 4 Q.H.
This course examines the social, economic, political, and educational history of Boston's black community in the nineteenth and twentieth centuries. The development of the black community and its institutions is a major focus, and students are encouraged to study the past in an attempt to understand the present and interpret the future. Research data include participant observation, oral history, interviews, and primary and secondary source materials.

25.281 Survey of African-American Music 4 Q.H.
Black music has evolved in fascinating ways over the past hundred years. Topics include the impact of African rhythm on black music, the New Orleans coalescence, regional development, ragtime, the emergence of large bands, the harmonic revolution of the 40s, bebop, the 1960s avant-garde and subsequent develop-

ments. Some analysis of specific jazz phenomena is included.

**25.283 Seminar: Creative Expression
In Blues and Jazz**

4 Q.H.

Blues and jazz have been among the most far-reaching and original artistic expressions of blacks in America. The course touches on possible African sources of inspiration for the musical literature of blues and jazz; a more important focus, however, is on blues and jazz as a reflection of African-American life and on the impact these musical forms have had on black self-image and position in American culture.

25.290-294 Directed Study

4 Q.H.

Directed study offers the ambitious student the opportunity to pursue a special intellectual interest not covered by the Department course offerings and to work on this interest with the Department faculty member of his/her choice. The faculty member will closely supervise the project and act as adviser for the duration of the quarter.

**25.295-298 Junior-Senior Honors
Program**

4 Q.H.

For prerequisites and other details, see section on the Junior-Senior Honors Program on page 1.

The following courses may be of interest to the student wishing to concentrate in African-American Studies. Descriptions for these courses may be found in the appropriate department listing.

- 21.145 Urban Society
- 21.150 Race and Ethnic Relations
- 21.270 Class, Power, and Social Change
- 20.250 Political Anthropology
- 20.255 Economic Anthropology
- 20.259 Urban Anthropology
- 22.132 Political Behavior
- 22.133 Political Parties and Pressure Groups
- 22.137 Civil Liberties
- 22.171 Law and Society
- 22.228 Government and Politics in Africa
- 22.233 International Law
- 22.242 The Politics of Revolution and Change
- 22.245 The Politics and Policies of Developing Nations
- 22.270 Political Theory
- 22.278 Contemporary Political Thought
- 26.101 Introduction to Philosophy
- 26.102 Introduction to Philosophy II
- 26.155 Moral Philosophy
- 26.120 Existentialism
- 26.131 Social and Political Philosophy

Philosophy and Religion

26.101 Introduction to Philosophy **4 Q.H.**

The course seeks to introduce students to philosophy by acquainting them with the theories and arguments of classical and contemporary philosophers and by teaching the skills of constructing and analyzing arguments. Students both learn about and engage in philosophical inquiry. While not all sections treat the same issues, typical areas covered include questions about the basis of morality, free will versus determinism, the existence of God, the problem of suffering, and the nature of knowledge.

26.103 Introduction to Religion **4 Q.H.**
(Formerly 26.183)

This course seeks to identify and appraise different ways of being religious: primitive, mystical, dogmatic, and ritual. Emphasis is placed upon appreciating the unique standpoint that each requires, how each sees the world in a radically different way, and how that leads to distinctive ways of life.

26.104 Understanding Religious Man **4 Q.H.**
(Formerly 26.177)

This course examines several important explanations of the nature, origin, and present significance of religious experience, beliefs, and practices in the light of modern knowledge and attitudes.

26.110 Ancient Philosophy **4 Q.H.**
(Formerly Classical Greek Philosophy)

An exploration of classical Greek philosophy, the course starts with a study/discussion of the roots of Western thought in the sixth century B.C. and argues the reasons for our debt to these original thinkers who were concerned with explaining the principles of external nature and the problems of human knowledge and conduct. Central to understanding these problems is the study of Socrates and his adversaries, the Sophists, and the two major figures he influenced: Plato and Aristotle. The course also covers Roman philosophy, the Stoics, and the Sceptics, who are a prelude to the early Christian philosophers of the first century A.D. Throughout the course, attention is placed upon the interplay between the philosopher and the moral, social, and religious context in which his thought arises. Student participation in class discussion is very important to the course.

26.111 Modern Philosophy **4 Q.H.**
(Prereq. 8 Q.H. philosophy)

The 100 years between 1650 and 1750, sometimes called "the century of genius," were a period in which philosophers reacted to the new scientific discoveries of Copernicus, Kepler, and Galileo. Out of this reaction came new ways of thinking about the nature of knowledge and the

nature of the world itself. The course focuses on the development of the rationalist and empirical philosophies during this period, with emphasis on Descartes, Leibniz, Spinoza, Locke, Berkeley, and Hume.

26.115 Chinese Philosophy 4 Q.H.

This course offers a study of Chinese philosophy in the ancient period (until 221 B.C.). Emphasis is placed on Confucianism, Taoism, and the *I Ching*. Less emphasis will be placed on the Logicians, the Mohists, and the Legalists.

26.114 Indian Philosophy 4 Q.H.

In this course we examine the two classical Indian philosophical systems of Hinduism and Buddhism. In examining Theravada Buddhism, we explore the view that it is possible for us to live without anxiety or suffering if we overcome our ignorance of reality and master our desires. Next, we turn to Mahayana Buddhism, focusing on its ethics of compassion and its related metaphysics of "voidness." In this part of the course, we examine questions which, in the West, are thought of as questions about personal identity and the nature of the self. In exploring Hinduism, we study Vedic mysticism as it comes to us through the *Upanishads*, as well as the influential ethics of the *Bhagavad Gita*. Among the philosophical issues that arise in our examination of Hinduism is the question of whether the method of yoga and meditation is a reasonable method for learning about the fundamental nature of reality.

While studying the classical texts of these systems, we will critically explore the techniques employed within these traditions: the method of yoga, the function of the guru, various methods of meditation, the point of nonviolence, the function of philosophical analysis, and the role of the austerities. In so doing, we study Hinduism as it is currently practiced in India; Theravada Buddhism as it is currently practiced in Sri Lanka and Thailand; the Tibetan tradition of Mahayana Buddhism; and the nonviolence of Gandhi.

To study Indian philosophy is to study a tradition of philosophy in which ethics is not fragmented from epistemology, knowledge is more than justified true belief, and one's metaphysics is to be realized. In our study, besides the classical texts, we will employ films and guest speakers.

26.120 Existentialism 4 Q.H.

(Prereq. 4 Q.H. philosophy)

Existentialist philosophy is examined in its greatest representatives, such as Kierkegaard, Nietzsche, Dostoevski, Heidegger, Jaspers, and Camus, with major attention given to Jean-Paul Sartre and Maurice Merleau-Ponty. The focus of this course will be on central themes, including self-alienation, unauthenticity, authenticity, and existential experiences. Existential philosophy

is examined in its historical, social, and cultural relations, and in its influence on psychology, psychoanalysis, sociology, political science, and literature, both in Europe and in the United States.

26.121 Analytic Philosophy 4 Q.H.

(Prereq. 8 Q.H. philosophy)

The development of the analytic movement from its beginnings in the early works of Moore and Russell. Some treatment of Russell's logical atomism, the logical positivists, the thought of Ludwig Wittgenstein, and their widespread influence.

26.122 Freud, Skinner, and Their Critics 4 Q.H.

(Prereq. 4 Q.H. philosophy or permission of instructor)

The course provides an examination of fundamental themes and concepts of Freud's psychoanalysis and Skinner's psychology from a philosophical perspective, and criticisms of them from the point of view of reformed Freudians and existentialists. Selections include Freud, Jung, Adler, Karen Horney, Skinner, Koestler, Pearls, Sartre, Merleau-Ponty, and Kovaly.

26.124 Philosophy of Psychology 4 Q.H.

(Prereq. 4 Q.H. philosophy or 4 Q.H. psychology or permission of instructor)

The course offers an examination of the philosophical and scientific foundations of behavioristic psychology, with emphasis on the acquisition and use of language. Discussion of alternative conceptions, e.g., Chomsky's and those arising from computer studies.

26.125 Philosophy of Mind 4 Q.H.

(Prereq. 4 Q.H. philosophy)

What is the relation between mind and body? Is the mental merely a function of bodily process and behavior or does it somehow exist "over and above" the material? How are self-knowledge and knowledge of other minds achieved? What is the relation between words and thoughts? This course, in part, seeks to show what puzzles and problems result from an honest attempt to answer these questions in a reasonable way. Classical sources, such as Descartes and Locke, and contemporary sources, such as Wittgenstein and Putnam, are examined. But the course also seeks to arrive at some *answers*—however tentative or provisional—to these questions. The student is constantly challenged to think and write well about these difficult subjects.

26.126 Philosophical Problems of Law and Justice

4 Q.H.

This course focuses on two general questions: What is the proper scope of the law? and How should the law be enforced? Under the first question, a number of issues are dealt with: whether the law has a legitimate right to restrict such activities as the use of drugs, deviant

sexual practices, or gambling. Topics included in the second question are the justification of punishment, rehabilitation as an alternative to punishment, and the death penalty.

26.127 Philosophy of Language 4 Q.H.
(Prereq. Permission of instructor)

The course examines prospects for a theory of language, its syntax and semantics. Contrasts between theory of reference and theory of meaning. Are there universals of language? Relations between linguistics and psychology. Readings from Frege, Quine, Russell, Chomsky, and Fodor.

26.130 Aesthetics 4 Q.H.
(Prereq. 4 Q.H. philosophy)

This course offers a historical approach to aesthetics. Aesthetics is the philosophical analysis of concepts and the solution of problems that arise when one contemplates beautiful (or ugly) objects; it is also concerned with standards of value in judging art. Aesthetics asks the following questions: What features make objects beautiful (or ugly)? Are there aesthetic standards? What is the relation of works of art to nature? What is the nature of an aesthetic experience?

26.131 Social and Political Philosophy 4 Q.H.
(Prereq. 4 Q.H. philosophy)

A consideration of basic questions about the nature of the state and the relationship of individuals to the state. What basis is there for individuals to obey the laws of the state? What conditions must a government meet to be legitimate? What justification can be given for democratic forms of government? What sorts of controls should the state exert over citizens? What benefits do citizens have a right to expect from the state? Readings will include both classical and contemporary sources.

26.133 Philosophy of Science 4 Q.H.
(Prereq. 4 Q.H. philosophy)

Science is the dominant intellectual force of our culture. This course focuses on the nature of scientific method, scientific theories, and scientific explanations. A central question is: Why is science thought to provide the most reliable account of the nature of reality? Various theories about the nature and reliability of science are considered.

26.134 Philosophy of Religion 4 Q.H.
(Prereq. 4 Q.H. philosophy)

The basic question in this course is "Does God exist?" The course examines several major arguments affirming and criticizing the notion of God's existence. A central problem in recent philosophy of religion is whether or not it makes any sense to speak of the truth (or falsity) of religious belief, as well as the implication an answer to that issue has for religious life; this topic will be examined in the latter half of the course.

26.135 Philosophy of Human Nature 4 Q.H.

The course offers a philosophical inquiry into the theories of man, man's dimensions, and human nature. The question of the existence of human nature is thoroughly examined. Special interest will be given to contemporary theories of man and self-alienation, and their influence in social sciences. Selected readings from Descartes, Hobbes, Hegel, Marx, Kierkegaard, Maritain, Freud, Skinner, Fromm, and Frankl.

26.136 Existentialism and Literature 4 Q.H.

After World Wars I and II, existentialist philosophy inspired the literature of "extreme situations." This course examines human extreme experiences in existentialist philosophy and novels. Some of the major themes are loneliness; self-alienation; social pressures; conformity; absurdity; anxiety; social, political and moral crises; nothingness; and death. Selected readings will include the most influential European and American authors.

26.137 Philosophy and Literature 4 Q.H.

The purpose of this course is to provide the student the opportunity to learn to recognize, appreciate, and criticize philosophical themes in literature. The readings typically include acknowledged classics by philosophical authors such as Voltaire, Dostoevski, and Sartre, as well as such popular contemporary authors as Vonnegut, Barth, and Pynchon. There are also some readings from more straightforward philosophical sources. Philosophical topics include the meaning of life, the human condition, depersonalization, alienation, human freedom, questions of value, responsibility, rationality, and personal identity. Religious, nihilistic, existential, and other points of view are explored.

26.144 Technology and Human Values 4 Q.H.

The course examines the changing values of the modern, technologically advanced world. Our study attempts to increase our understanding of the supposed breach between the literary and scientific cultures, the diverse approaches toward their reconciliation, and the human dimensions of science and technology. Other relevant topics are the neutrality of technology with respect to good or evil uses, technology as an instrument for human liberation, and the issue of proper and effective modes of controlling technology in today's world. Pirsig's widely read paperback, *Zen and the Art of Motorcycle Maintenance*, is studied, as is Lynn White's *Dynamo and Virgin Reconsidered*. Other important writers to be considered include Kurt Baier, J. Bronowski, Barry Commoner, Erich Fromm, Karl Marx, and C. P. Snow.

26.145 Technology and the Individual 4 Q.H.

This introductory course attempts to awaken some philosophical reflectiveness regarding the potential benefits and threats to individuals that

derive from technological change. The course explores and discusses such issues as the relation of technology to human freedom and privacy, the effects of "future shock" upon the individual, the possibility of the tyranny of a technological elite, and the prospects for the transformation of humankind. Some writers see technology as the salvation of humanity; others see technology leading to dehumanization, a decrease of freedom, and a developing sense of alienation; still others see the extinction of "human nature" as we once knew it. Where is the truth in all of this? What are the social, psychological, and philosophical meanings and consequences of technological change in our day and in the future? Some of the major readings for the course are from Alvin Toffler's *Future Shock*, Herbert Marcuse's *One Dimensional Man*, Jacques Ellul's important criticism *The Technological Society*, and Lewis Mumford's *The Transformation of Man*.

26.148 The Meaning of Life 4 Q.H.

The course offers an examination of selected philosophical problems of human existence in the contemporary world, with major emphasis on the search for identity and self-fulfillment. Selected problems are discussed, such as freedom, death, sexuality, alienation, becoming a person, and peak experiences. The course includes readings from Kierkegaard, Heidegger, Sartre, Camus, Maslow, Allport, Frankl, Rogers, and Rollo May.

26.149 Introduction to Logic-2 4 Q.H.
(Prereq. 26.150)

Further study of the techniques of logic in the analysis and creation of argument. The logic of predicates, quantifiers, and relations. Practice in applying these techniques to natural arguments. Consideration of the forms of definition and the evaluation of empirical generalizations.

26.150 Introduction to Logic-1 4 Q.H.

A practical introduction to the logic of propositions and the syllogism. Principles of critical reasoning and fallacies. Practice in applying logical techniques to the creation and criticism of argument.

26.151 Symbolic Logic 4 Q.H.

The course offers a presentation of the syntax and semantics of propositional logic and first-order quantification theory. Relations between these systems and natural language are considered. The course covers analysis of the notion of derivation within a system and the notion of logical consequence, and practice in analyzing logical structure in natural language sentences.

26.152 Theory of Knowledge 4 Q.H.
(Prereq. 4 Q.H. philosophy or permission of instructor)

This is an introduction to epistemology, or theory of knowledge, which asks the following

questions: What is knowledge? Is knowledge (or even certainty) attainable? What are the limitations of human knowledge? How is knowledge—if we have it—acquired? What roles do reason and experience play in the attempt to attain knowledge? This course uses both classical (Rene Descartes and David Hume) and contemporary sources (Bertrand Russell and others). Various theories of knowledge, such as empiricism, rationalism, and scepticism, are examined and criticized. The student is encouraged to form at least tentative opinions on these issues.

26.153 Metaphysics 4 Q.H.
(Prereq. 8 Q.H. philosophy)

The course offers a consideration of central problems and theories concerning the nature of reality, with special attention to such areas as the relation between mind and matter, free will and determinism, and criteria of existence.

26.155 Moral Philosophy 4 Q.H.
(Prereq. 4 Q.H. philosophy or religion or permission of instructor)

What sorts of things are good and bad? What actions are right and wrong? These two basic questions are explored. The course covers major classical conceptions of ancient Greece and Rome, their replacement by the Western religious ethic, its modification and rejection in the early modern period, and the emergence of modern versions of traditional conceptions of the good life, with reflections on the nature of ethical inquiry itself as a legitimate study.

26.159 Ethics: East and West 4 Q.H.

Is there a *best* way to live? Is there a way a human being *should* live? In both Eastern and Western philosophy there are claims that a way of life exists that leads to happiness, power, and wisdom. This course explores this claim by studying the thought of such philosophers as Socrates, Buddha, Plato, Aristotle, Lao Tzu, Epictetus, Marcus Aurelius, Aquinas, and Spinoza, as well as by studying some of the classical Hindu and Buddhist texts.

26.162 The Ethics of Human and Animal Experimentation 4 Q.H.

This course explores the conflicts that arise between the value of free scientific inquiry on the one hand, and the rights, vulnerabilities, and suffering of human and animal subjects on the other. Topics include traditional issues involving informed consent, voluntariness, coercion, experimental design, risk-benefit analyses, institutional review boards, and professional guidelines, as well as such less traditional issues as the competing conceptions of progress, whether we have obligations to non-human animals, and what, if anything, justifies us in treating nonhuman animals in ways in which we know we should not treat human animals.

26.163 Ethical Issues of Taxation 4 Q.H.

Although we tend to believe that persons have a right to their own labor, a right to their own property, and a right to exchange their labor or property for the labor or property of other consenting adults, it seems that income taxes, property taxes, and sales taxes violate these rights. This course explores two basic questions: Is any taxation morally justified? Are there moral grounds for choosing among taxation policies? Specific topics include competing conceptions of private property; the "progressive versus regressive taxation" controversy; the "flat tax" controversy; the alleged problems with interpersonal utility comparisons; and questions involving the distribution of tax monies, e.g., whether those who have more than they need have any moral obligation to provide for the needs of the poor.

26.165 Medicine, Religion, and the Healers' Art

4 Q.H.

This course explores aspects of the historical, religious, and cultural context for contemporary alternatives in health care, beginning with an examination of several examples of traditional healing practices and their accompanying religious and philosophical views about human life. Course material explores this "holistic" tradition in two frames of reference: the ascendancy of scientific rationalism over religion, and the takeover, by male-dominated professions, of healing functions that society has traditionally assigned to women (e.g., the rise of obstetrics and the suppression of midwifery). Special attention is given to major women healers of the nineteenth century. Course includes a look at some contemporary efforts at reintegration of scientific and traditional values in the modern health care system. Students will also meet and interact with patients and healers active in the modern holistic health movement.

26.166 Philosophical Ethics and Journalism

4 Q.H.

This course examines classical ethical theories such as utilitarianism and Kant's categorical imperative and seeks to apply them to the moral problems of professional journalism. It will explore the question of whether journalists face moral obligations beyond those delineated in professional ethical codes. Other areas examined could include objectivity in reporting, questions about possible limits on the duty to inform, and consideration of what special rights and responsibilities, if any, journalists have by virtue of being journalists.

26.168 Moral Problems in Medicine

4 Q.H.

This course examines two fundamental ethical systems, one of which is grounded on the dignity of the person, the other on the intrinsic value of happiness. The course then explores the difficult issues of euthanasia, suicide,

paternalism, medical experimentation, the patient's right to consent to any therapeutic intervention, and the concept of death with dignity. After studying these and related moral issues, the larger economic and policy issues of justice, some of which are current in political debates are examined (for example: Is there a right to health care?). It is hoped that this course will encourage the student to become more sensitive to moral problems as they arise in medical settings, better able to deal with these troublesome issues, and perhaps more courageous in facing them if that becomes necessary. The course also offers an investigation into the questions of abortion, euthanasia, infanticide, genetic counseling, psychosurgery, and human experimentation from the standpoint of both philosophical ethics (such as the theory of the end justifying the means) and religious ethics (such as the natural law theory of the Roman Catholic Church).

26.170 Western Religions

4 Q.H.

Western religion is grounded in the experience of God's presence, which transcends and transfigures the life of the individual and the community. This encounter is the essence of Judaism, Christianity, and Islam. Drawing on autobiography and biography, this course delves into the personal religious quests of such major religious thinkers as St. Augustine, St. Theresa, Martin Luther, Elie Wiesel, Richard Rubenstein, Deitrich Bonhoeffer, and Mohammed.

26.171 Eastern Religions

4 Q.H.

Eastern religions appear to be fundamentally different from the orthodox religions of the West. Not only do Hinduism, Buddhism, and Taoism promise a solution to the problem of suffering (compare the common Christian and Jewish attitudes), but most of these religions do not have a central God personality, and some explicitly reject such a concept as meaningless, or at least as irrelevant to leading a religious life. Central to these views is a way of being in the world which emphasizes meditation, skillful and compassionate action, and a direct awareness of the fundamental nature of reality. The course first tries to make sense of the difficult notion that the way we perceive reality may be illusory. It then examines Theravada Buddhism, a religion that rests on the insights that everything is impermanent and that it is possible to live fully in the present without any suffering. From Theravada Buddhism, the course turns to Mahayana Buddhism, and then to Taoism, a subtle view that emphasizes the "flow" of life and that "the way to do is to be." Next, the Hinduism of the *Upanishads* is examined. As part of the exploration of this form of Hinduism, students are given the opportunity to examine intellectually and also to practice a few methods of meditation. In addition, the course investigates the devotional aspect of Hinduism as

expressed in the *Bhagavad Gita*. There will also be an exploration of Zen.

26.172 American Faiths

4 Q. H.

(Formerly 26.275)

This course will approach the American religious tradition from three perspectives. First, we shall examine the transplanted and transformed European traditions in the context of American diversity and pluralism. The Protestant, Roman Catholic, and Jewish traditions will be the most significant examples. Second, we shall look into the rise and establishment of largely indigenous religious groups who have forged their own foundations in the midst of the older traditions. Among others, the Mormons, the Hutterites, the Mennonites, the perfectionist groups (such as the older Oneida Community and the Shakers, and the more recent "cults"), and the Black and Native American groups are especially significant because of their attempts to survive apart from the general culture. Third, we shall explore the theory of an American Civil Religion, the notion that there is a general religious meaning for American culture that makes the coexistence of the many religious groups possible and gives to that culture and its history a religious significance. The purpose of the course will be to achieve an understanding of what is unique and viable in the American religious tradition.

26.173 Cults and Sects

4 Q. H.

This course offers an examination of the varieties of religious experience from the perspectives of sociology and psychology of religion. This course focuses on such cultic and sectarian groups as Christian Science, the American Shakers, the Unification Church, the Hare Krishna movement, and the Black Muslims. The primary purpose of this course is to provide the student the opportunity to acquire critical investigative tools with which to analyze different religious expressions.

26.174 Islam

4 Q. H.

The course explores the history of Islam, its conflicts with the West in past and present, Islamic beliefs, the future of Islam as a world religion, and relations of Islam with Christianity and Judaism. Since Islamic faith touches upon social, political, and legal issues, the course is concerned with them as well as with the more familiar religious and theological questions.

26.176 Understanding the Bible

4 Q. H.

This course introduces students to the Old and New Testaments, so that they may enter into a dialogue with the Bible, understanding not only what it says, but why it is said that way. To do this, discussion focuses on the Bible's social, political, and cultural backgrounds.

26.178 Religion in a Social Context

4 Q. H.

This course offers an exploration of the social forms of religion. The structures and roles of the church, synagogue, and sect are described and

critically evaluated. In addition, emphasis is given to their functions, with reference to general social structure, process, and reform.

26.182 Religion in the Age of Science

4 Q. H.

This course examines the problems posed by the interaction between religion and the natural and social sciences. Representative selections from Hume, Darwin, Marx, Freud, Erickson, and Troeltsch are used to interact with selections from Bultmann, Teilhard de Chardin, Niebuhr, Bonhoeffer, and Tillich.

26.187 The Meaning of Death

4 Q. H.

This course offers an inquiry into different philosophical and religious perspectives on death and life after death, including an examination of some powerful contemporary accounts of personal confrontation with death, along with investigations into attitudes toward death in other traditions (e.g., Hinduism and Buddhism). In addition, the course explores responses to the Holocaust in Europe, and theories about life after death (such as those discussed in Raymond Moody's *Life After Life* and Ian Stevenson's *Reincarnation*).

26.188 The Occult as Religion

4 Q. H.

The course focuses on the history, aims, and methods of such esoteric or mystic doctrines as astrology, numerology, magic, demonism, and divination, and investigates the structural similarities of these religious forms to those of the dominant religious traditions of the world.

26.189 Philosophy of Death, Grief, and Dying

4 Q. H.

This course explores fears about death and dying and the grieving process, and examines the processes people sometimes experience while dying. In addition, the course examines current practices of caring for the dying and of coping with bereavement, questioning whether these practices are, in fact, healthy, helpful, and/or ethical. Other relevant ethical issues to be examined include euthanasia, truth-telling with the dying, suicide, and paternalism. The course will close with the question of the meaning of life, given the fact that we must die.

26.190, 191, 192 Honors I, II, and III (each)

4 Q. H.

Students interested in taking Junior-Senior Honors courses should confer with Department Chairperson. Arrangements are made between the student and a member of the faculty. *Staffing*: by arrangement.

26.195 Directed Studies

4 Q. H.

(Prereq. By arrangement between student and faculty.)

Those interested in the Directed Studies program should meet with Department Chairperson. *Staffing*: by arrangement.

26.251 Advanced Logic

4 Q. H.

(Prereq. 26.151)

The course offers a study of the major results in the meta-theory of first-order logic. Consistency,

completeness, and decidability. Discussion of the general notion of an effectively computable process, Church's thesis, and the existence of unsolvable problems.

26.265 Seminar in Wittgenstein 4 Q. H.
(Prereq. 8 Q.H. philosophy or permission of instructor)

Ludwig Wittgenstein is one of the most influential, if not the most influential, philosophers of the 20th century. A mysterious yet charismatic figure, he possessed both analytic genius and the creativity of a visionary. With unparalleled intensity, he addressed himself to philosophical problems: What is the relationship between language and the world? Are there thoughts "too deep" for words? What, if anything, can be said about the mystical, the beautiful, and the religious? What is consciousness and what is its role in action? What are the big, simple, mistaken ideas that cripple the philosophical enterprise? How should philosophers proceed? What is meaningful?

Wittgenstein's thought is so unique that it cannot be said that any other course, or courses, in Philosophy will prepare the student for it. On the other hand, intelligent students with little

formal preparation can profit from a study of Wittgenstein, given the proper dedication to truth.

26.267 Seminar in Nietzsche 4 Q. H.
(Prereq. 8 Q.H. philosophy or permission of instructor)

26.276 Mysticism: East and West 4 Q. H.
(Prereq. 26.104 or permission of instructor)

The course offers an inquiry into mystical experience through a comparative study of the writings of Christian, Buddhist, and Hindu mystics and of secondary interpretive sources. Areas taken up are the potential oneness of man and God, the conflict of mystics with traditional forms of religion, and the possibility of a common, cross-cultural basis for mysticism.

26.290 Issues in Medical Ethics 4 Q. H.
(Prereq. permission of instructor)

This course focuses on issues in medical ethics, especially as they are likely to arise in a clinical setting. Course begins with exploration of the two basic systems of ethical theory and then concentrates on their application in cases exemplifying the issues of euthanasia, paternalism, experimentation, informed consent, quality of life, professional responsibility, right to health care, truth telling, genetic control, abortion, and the allocation of scarce medical resources.

Art and Architecture

27.113 Creative Drawing 4 Q. H.

The course focus is on basic drawing in pen and ink, pencil, charcoal, brush, and related media. Course includes fundamentals of form, volume, and texture in drawing.

27.115 Basic Painting 4 Q. H.

This is an introductory studio course in the fundamental techniques of painting. Formal problems in the study of color, light, space systems, form, and composition establish the foundation for more individual creative expression. Critiques and slide lectures are used as needed.

27.118 History of Art to 1400 4 Q. H.

The course provides a survey of Western art from prehistoric times to the Renaissance.

27.119 History of Art since 1400 4 Q. H.

The course provides a survey of Western art from the Renaissance to the twentieth century.

27.121 Contemporary Directions in Cinema 4 Q. H.*

The course offers a comparative study of selected films by major contemporary directors. Film screenings, discussions, assigned readings, and lectures.

27.129 Photo Silkscreen 4 Q. H.*

The course focuses on creative use of the photo silkscreen process, developing ideas visually through a combination of photography and hand-cut stencils. Emphasis is on organizing relations between the forms in order to communicate the idea effectively. No previous knowledge of photography or silkscreen necessary.

27.136 Classical Art 4 Q. H.

The course offers a concentrated study of Greek and Roman sculpture, architecture, and painting.

27.137 French Painting 4 Q. H.

The course examines French painting of the nineteenth century, focusing on romanticism, realism, impressionism, and their cultural implications.

27.139 Medieval Art and Architecture 4 Q. H.

The course focuses on Romanesque and Gothic art and architecture from the tenth to the fifteenth centuries.

27.150 History of Photography 4 Q. H.

The course offers a study of development of photography from early nineteenth century to present.

*Lab fee required.

27.151 Modern Painting 4 Q.H.

The course provides a survey of twentieth-century painting, including major schools such as impressionism, cubism, surrealism, and expressionism. Course includes visits to museum collections and contemporary art galleries.

27.152 Introduction to Art 4 Q.H.

The course offers a basic introduction to the characteristics of the visual arts, including painting, sculpture, graphic arts, and architecture. Various examples of works of art are studied as an introduction to style and technique. Course includes visits to museum collections and contemporary art galleries.

27.155 History of Marine Painting 4 Q.H.

A study of the image of the sea as used by various painters. The work of such artists as Turner, Delacroix, Monet, Rembrandt, and many others will be examined stylistically within a historical context.

27.161 American Architecture 4 Q.H.

This course provides a survey of major developments in American architecture from colonial times to the present, with emphasis on stylistic developments and influences affecting architectural directions in America.

27.162 American Sculpture and Painting 4 Q.H.

A survey of major developments in American sculpture and painting from colonial times to the present, this course emphasizes stylistic considerations and influences affecting the development of these art forms.

27.163 The American Film 4 Q.H.*

A historical survey of the unique rise of the American film and its influence on a burgeoning new international art form. Key films representing major aesthetic or technical developments from the late nineteenth century to the present are screened weekly and discussed.

27.175 Late Nineteenth-Century American Architecture 4 Q.H.

The course offers a survey of the "stick and shingle" architectural styles, as well as more general developments. Introductory lectures are followed by student presentations on selected topics.

27.178 Contemporary Architecture and the City 4 Q.H.

The course offers a study of the great figures and chief movements of American and European architecture and city planning of the twentieth century.

27.177 Introduction to Architecture 4 Q.H.

The course offers a survey of the stylistic characteristics of architecture from ancient periods to the present.

27.178 Technology, Architecture, and the City 4 Q.H.

The course offers an examination of the role of technology and architecture in shaping the built environment of the American city, with special emphasis on Chicago, New York, and Boston. The course also investigates the effects of physical planning, especially urban renewal and the recycling of older buildings.

27.183 Seminar in Modern Art and Architecture 4 Q.H.

(Prereq. One course in post-Renaissance art history).

The course focuses on selected topics in modern art and architecture.

27.186 Documentary Film 4 Q.H.*

The course offers a study of the aesthetics and tradition of the documentary film, with a major emphasis on contemporary directions.

27.189 Basic Photography I 4 Q.H.*

The course is intended to acquaint the beginning student with the use of the camera, the negative, and the print. Weekly shooting assignments, demonstrations, and hands-on lab experience are part of this active, primary-level course.

27.190 Filmmaking Workshop 4 Q.H.

This is an introductory course in the creative use of the film medium. Emphasis will be placed on weekly lab assignments designed to develop skills in the fundamental techniques of filmmaking. A final film project expressing an original idea in film form will be required of each student. Film screenings, lectures, and critiques. Equipment will be provided by the department.

27.191 Renaissance Art and Architecture 4 Q.H.

The course focuses on Italian painting, sculpture, and architecture of the fifteenth and sixteenth centuries, with special reference to the historical and social forces that shaped them.

27.193 Arts of the Old West 4 Q.H.

The course offers a survey of the arts of the early settlers of the American West, including Indians and frontiersmen, revealed through the buildings, painting, photography, and films of the Old West.

27.194 Intermediate Drawing 4 Q.H.

The main focus of this course is to heighten the student's understanding of spatial awareness, scale movement, and expression. Students will be asked to create unusual environmental situations for their figurative compositions. A variety of media will be used, including wash, pen and ink, watercolor, chalk, charcoal, and pencil.

27.195 Animation Workshop 4 Q.H.

An introductory course in the creative possibilities of the animated film. Weekly lab assign-

*Lab fee required.

ments and a final project will acquaint students with various animation techniques and the creative advantages of each. Film screenings, lectures, and critiques. Equipment supplied by the department.

27.197 Art and Society 4 Q.H.

The course offers an examination of the way in which societal forces and political ideologies are expressed in the visual arts, especially in painting and architecture. The course combines a broad overview of a few significant historical periods with a more focused concentration on the past two hundred years.

27.198 History of Film 4 Q.H.*

This course offers an introductory historical survey of the development of film as an art form from the late nineteenth-century handcolored silent films to the contemporary international movement. Lectures, screenings, and discussions.

27.199 Intermediate Photography Workshop 4 Q.H.*

(Prereq. 27.202 or equiv.)

Through close interaction with the teacher, students are asked to refine their technical skills and to make meaningful decisions about their relation to the world around them through the use of photography. Alternative processes such as infrared, toners, and large format will be demonstrated and used. Increased attention to contemporary trends in photography will be shown with frequent slide presentations. In short, a qualitative approach to substantive photography.

27.200 Contemporary Directions in Photography 4 Q.H.

A slide/lecture course designed to acquaint the student with trends in twentieth-century photography. Photojournalism, documentary, commercial, and creative photography will be examined closely in relation to other communication media.

27.201 Architecture and the City 4 Q.H.

This course provides a selective examination of Western architecture in the context of the urban environments that produced it. Special attention

is paid to the cultural and social forces which shaped this architecture of the cities.

27.202 Basic Photography 2 4 Q.H.*
(Prereq. 27.189 or equiv.)

A continuation of 27.189 with more emphasis on combining personal aesthetic choices with refining darkroom skills. A final portfolio at the end of the course as well as weekly shooting assignments are required.

27.203 Introduction to Architectural Design 4 Q.H.

An introduction to fundamental design principles and their application to the built environment. Lectures, two- and three-dimensional design projects, and field trips.

27.291, 27.292, 27.293 Directed Study (each) 4 Q.H.

These courses offer independent work under the direction of members of the Department on a chosen topic. Limited to qualified junior and senior students majoring in art, with approval of the Department.

27.295, 27.296, 27.297 Junior-Senior Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

93.159 Introduction to Art, Drama, and Music 4 Q.H.

An introduction to the basic formal language of music, drama, and the visual arts. The course focuses on such formal elements as space, time, structure, color, and interval by showing how these formal elements are, in effect, the "language" of the arts, and how they render intelligible a given art form. Lectures, discussions, and visits to museums and performances.

93.165 Humanistic Themes in the Arts 4 Q.H.

An examination of the way in which certain humanistic themes and topics have been interpreted through music, drama, and the visual arts. The themes included are "The Arts and Identity" and "The Arts and A View of the World," with focus on such topics as "The Arts as Social and Political Commentary." Lectures, discussions, and visits to museums and performances.

Music

28.100 Music I 4 Q.H.

This course offers an introduction to selected works of our musical heritage from earliest to contemporary styles. It is primarily a survey and listening course, with emphasis on styles, basic theory, forms, and the historical, social, and artistic periods which these works represent.

28.102 Learning to Read and Write Music 4 Q.H.

This is a basic course for those who want to learn how to read a score or how to write a tune. Students have the opportunity to learn to sight-read music and to compose in some of the basic forms (song, theme and variation, etc.)

28.105 Fundamentals of Music Theory 4 Q.H.

This course offers the student the opportunity to learn simple melodic and rhythmic dictation skills; to recognize and build scales, intervals, and triads; and to sing at sight simple tonal melodies.

28.106 Theory I, Tonal Techniques A 4 Q.H.
(Prereq. 28.105)

This course focuses on basic theoretical skills such as ear-training, sight-singing, and dictation. Also included are beginning studies in harmony and the analysis of music.

28.107 Theory II, Tonal Techniques B 4 Q.H.
(Prereq. 28.106)

This course is a continuation of 28.106 and concentrates on intermediate levels of ear-training, sight-singing, and dictation. Additional work in harmony and analysis is undertaken.

28.108 Theory III, Tonal Techniques C 4 Q.H.
(Prereq. 28.107)

This course is a continuation of 28.107 and includes principles of harmonization and modulation, realization of figured-bass, advanced ear-training, and two-part counterpoint. The student will also have the opportunity to undertake original composition.

28.109 Analysis of Musical Masterworks 4 Q.H.
(Prereq. 28.108)

This course offers an analysis of a small number of musical masterpieces covering a diverse range of styles within the "Western" tradition. Aspects of phrasing, harmony, harmonic rhythm, orchestration and rhythm are analyzed.

28.110 Masterworks of Musical Literature II 4 Q.H.
(Prereq. 28.109)

This course represents analytic techniques which can be applied to selected musical literature of the nineteenth and twentieth centuries. A small number of masterworks will be examined in detail, with attention given to the evolution of harmonic idioms and formal principles.

28.112 Music of the Baroque Era 4 Q.H.

This course focuses on music of the seventeenth and early eighteenth centuries in Italy, Germany, France, and England. The emergence of important new genres (such as opera, sonata, and concerto) is discussed, and representative works of major composers (including Bach, Handel, Corelli, Vivaldi, Rameau, and Purcell) are examined.

28.115 Music of the Classical Era 4 Q.H.

This course focuses on crucial developments in musical styles and forms of the late eighteenth century and on emerging genres, such as the symphony, the concerto, and the string quartet. Emphasis is placed on the vocal and instrumental works of Haydn and Mozart and on the early works of Beethoven.

28.117 Medieval and Renaissance Music 4 Q.H.

This course offers an introduction to European music from the sixth through the sixteenth centuries. A wide variety of music is covered, ranging from the serene elegance of sacred Gregorian chant and the plaintive love songs of the Medieval troubadours to the lively dances and humanistic vocal music of the Renaissance. Representative works by composers such as Machaut, Landini, Josquin, Palestrina, and Dowland will be examined.

28.119 Music of the Avant-Garde 4 Q.H.

Experimentation in music takes many forms. This course will cover a number of areas of contemporary music including new sound resources (both electronic and acoustic), new methods of organization in music, and the use of music in avant-garde film and theater.

28.120 Survey of Music History 4 Q.H.

This course provides a chronological view of Western music, while examining the role of music in society and exploring the contributions of influential composers. Representative works from each period are discussed, including compositions by Machaut, Josquin, Bach, Handel, Mozart, Haydn, Beethoven, Berlioz, Wagner, Mahler, and Stravinsky.

28.123 Music of the Romantic Era 4 Q.H.

This course focuses on romantic realism and idealism as expressed in the music of the nineteenth century. Emphasis is placed on historical, nationalistic, and literary influences. Composers studied include Beethoven, Schumann, Schubert, Berlioz, Liszt, Verdi, Wagner, Brahms, Tchaikovsky, and Mahler.

28.124 Traditional Folk Music of the Western World 4 Q.H.

This course focuses on the folk music of Europe, Africa, North and South America, Asia, and Australia. Emphasis will be given to the ethnic music, dances, traditions, epics, and sagas that have influenced the Western and Eastern cultures.

28.125 Great Choral Literature 4 Q.H.

This course provides an analysis of sacred and secular choral literature from medieval to contemporary times.

28.126 Music as a Means of Social Expression 4 Q.H.

The course deals with the artist's involvement with recurring social themes of the human self-image, the search for peace and understanding, society's treatment of minority groups, and sexual relationships. Painting and literary works are examined in addition to works by Beethoven, Schoenberg, Britten, and jazz composers.

28.128 Post-Romanticism in Music 4 Q.H.

This course focuses on music of the late nineteenth and early twentieth centuries, a time in which music reached a high level of emotional intensity. Representative works of composers

such as Mahler, Bruckner, Schoenberg, Berg, and Strauss are examined.

28.135 Music the U.S.A. 4 Q. H.

This course examines American music from the time of Puritan psalm singing to the present. A wide variety of music will be covered, including concert music, traditional folk music, jazz, and contemporary styles.

28.136 Music in Popular Culture

This course deals with the nature of music composed for the mass market. Techniques of recording and merchandising music are discussed, and selected songs are analyzed for their musical content. The evolution of various styles will be traced, including ragtime, jazz, blues, and rock.

28.138 Nationalism in Music 4 Q. H.

This course focuses on music written in affirmation of national identity. Many of the works to be studied incorporate folk elements of the composer's culture. Among the composers to be studied are Rimsky-Korsakov, Dvorak, Sibelius, Grieg, Bartok, and Ives.

28.140 Mozart 4 Q. H.

Mozart's musical development from child prodigy to mature artist is traced from personal letters and biographies. Many of his major compositions, including symphonies, concertos, operas, and chamber works, are analyzed.

28.141 Twentieth-Century Music:

Debussy to Schoenberg 4 Q. H.

This course focuses on developments in music from 1900 to mid-century. Topics include impressionism, expressionism, neo-classicism, and other major trends in music of the twentieth century.

28.142 Stravinsky 4 Q. H.

This course focuses on the life and works of Igor Stravinsky, the man who has been perhaps the most influential of all twentieth-century composers. Important works (such as *The Rite of Spring*, *Symphony of Psalms*, *The Rake's Progress*, and *Agon*) will be selected from each of his major stylistic periods, and his contributions to twentieth-century musical style will be assessed.

28.144 Debussy and the Music of Paris

4 Q. H.

Claude Debussy, impressionist in sound, composed music that marked a turning point toward modern trends. This course covers much of his music for piano, orchestra, and voices, including *Suite Pour le Piano*, *Suite Bergamasque*, *Images* (for piano and for orchestra), *Nocturnes*, *La Mer*, and *Pélleas et Mélisande*. The music of Satie, Ravel, and Fauré, as it relates to that of Debussy, will also be discussed.

28.145 Beethoven

4 Q. H.

This course analyzes the complex personality and art of Beethoven, his relation to the turbulent times in which he lived, and his role in classical and romantic music.

28.147 Music of the Middle East

4 Q. H.

This course is an introduction to the music of selected Near Eastern and Arab cultures, such as Persian in the East and Ethiopic and Berber in Africa, as well as the traditional instruments of the areas. The cantillation styles and practices of various chants of the Hebrew, Christian, and Islamic traditions are also included.

28.148 Rock Music

4 Q. H.

This course focuses on the history of rock music from its origin in American blues and other styles through the popular music of the 1950s, the political styles of the 1960s, and the diverse trends of the 1970s. Major emphasis is placed on the formative years of rock. Students may be required to attend rock performances in the Boston area.

28.150 Music in Concert

4 Q. H.

This music appreciation course is designed to increase the listener's aesthetic development. Students have the opportunity to develop musical understanding through the study of music that is performed today in concerts by major symphony orchestras in the U.S. and throughout the world. Study materials are selected from actual symphony concert programs and include critical and analytical comments by some of the foremost critics and scholars. To make this course accessible to the uninitiated listener, the course is conducted in nontechnical language.

28.160 The Symphony

4 Q. H.

This course offers a study of the symphony as a major genre in the classical, romantic, and contemporary periods. Works by Haydn, Mozart, Beethoven, Schumann, Tchaikovsky, Brahms, Sibelius, Prokofiev, and others are studied.

28.162 Piano Music: The Great Composers and Performers

4 Q. H.

This course will give students the opportunity to hear and analyze some of the greatest works written for the piano performed by some of the world's greatest performers. In addition to recordings by internationally acclaimed artists, several live performances by guest artists from the Boston area and the Northeastern University Music Department will be presented in class. Students will be expected to attend and write a review of one outside concert in addition to reviewing in-class performances.

28.163 Music and Poetry

4 Q. H.

This course will examine the art of setting words to music. It will confront the aesthetic problems encountered in a synthesis of two different art

forms. That synthesis will then be examined in selected songs, choral works, tone poems, and operas of diverse periods and styles (classical, folk, and popular). Guest lecturers on various aspects of literature will be incorporated into the course.

28.164 Historical Instruments Workshop 4 Q.H.

This course is for those who wish to learn to play a medieval, Renaissance, or baroque instrument. In addition to teaching basic skills on instruments such as recorder, flute, crumhorn, viola da gamba, vielle, cornetto, and harpsichord, the course will provide opportunities for developing proficiency in music reading and ensemble playing.

28.165 The Music Industry 4 Q.H.

This course will examine business-related areas of the music industry. Included will be topics such as the make-up and structure of the record industry and music publishing world, the function of performing rights organizations (ASCAP and BMI), and the role of concert and orchestral managers. Guests from the various fields will be invited to lecture in class, and trips to "behind the scenes" locations will be arranged.

28.166 Women in Music 4 Q.H.

This course examines the multi-faceted role of women in music from the Renaissance through to the present. For centuries women have been active and influential patrons, composers, teachers, conductors, and performers in Europe and America. Their contributions to classical and popular music and to jazz will be examined, with emphasis on such widely varying figures as Queen Elizabeth I, Elizabeth Jacquet de la Guerre, Fanny Mendelssohn Hensel, Clara Schumann, Mrs. H. H. A. Beach, Germaine Tailleferre, Billie Holiday, Carla Bley, Ruth Crawford Seeger, Pauline Oliveros, Sarah Caldwell, Antonia Brico, and Nadia Boulanger.

28.167 Music of Africa 4 Q.H.

The music of Africa is as varied as that continent's many linguistic and tribal identities. This course will provide a broad survey of the musical traditions of Africa with respect to their historical, social, and cultural background, as well as an approach to musical organization, musical practice, and significant aspects of style. These will all be discussed in light of possible contributions to contemporary African-American music.

28.180 Introduction to Opera 4 Q.H.

This course offers an analysis of opera as a dramatic form. Aria, recitative, ensemble, and other basic elements of opera are isolated and discussed. Numbers opera, music drama, and singspiel are some of the types of opera considered. Composers whose works are analyzed include Mozart, Wagner, Verdi, and Puccini.

28.181 Contemporary Opera 4 Q.H.

Most major composers of the twentieth century, including Schoenberg, Berg, Bartok, Stravinsky, Hindemith, and Poulenc, have contributed to the opera repertory. Among the diverse works to be studied are: *Wozzeck*, *The Rake's Progress*, *Dialogue of the Carmelites*, and *Bluebeard's Castle*.

28.182 Wagner's Ring Cycle 4 Q.H.

This course offers an in-depth study of Wagner's cycle of music-dramas: *Das Rheingold*, *Die Walküre*, *Siegfried*, and *Götterdämmerung*. Wagner's compositional techniques (e.g., the use of leitmotif and musical metaphor) are examined in detail.

28.200 Jazz 4 Q.H.

The course focuses on jazz from its origins in New Orleans to the avant-garde experiments of today. The rhythmic, harmonic, instrumental, and stylistic characteristics of jazz are analyzed. Attention is given to the works of creative jazz artists such as Armstrong, Beiderbecke, Parker, Ellington, and Coltrane.

28.201 The New Jazz 4 Q.H.

The course offers an in-depth study of various recorded works of important jazz performers/composers with respect to their works as creative artists: Armstrong, Beiderbecke, Ellington, Coltrane, Miles Davis, etc. The study is not chronological but deals rather with the dynamics of artistic growth and change. Special attention is given to the developments of the last decade.

28.202 Black Artists in Music 4 Q.H.

The course offers a study of the contributions of black composers and performers to the world of music.

28.230 Musical Performance I 1 Q.H.

(Prereq. Audition or permission of instructor)

The course includes participation in rehearsals and public performances and/or research, composition, arranging, conducting, solo and ensemble activity, etc., with the Chamber Orchestra, the Early Music Players, the N.U. Chorus, the N.U. Bands, or other ensembles, under the supervision and coaching of a faculty member of the Music Department. The student's progress will be evaluated at the end of the quarter by audition or otherwise.

28.231 Musical Performance II 1 Q.H.

Continuation of 28.230.

28.232 Musical Performance III 1 Q.H.

Continuation of 28.231.

28.233 Musical Performance IV 1 Q.H.

Continuation of 28.232.

28.240 Piano Class I 4 Q.H.

This is an introductory course in piano designed for adults who may have had no previous study in music. The course combines learning to read music with improvisation and accompaniment of

simple tunes. Some theory is introduced to clarify the structure of pieces studied in class.

28.241 Piano Class II 4 Q. H.
(Prereq. 28.240)

This course is a continuation of the skills developed in Piano I, with emphasis on increasing students' flexibility at the keyboard through study of scales, transposition, and modulation. Repertoire includes works by Bach, Bartok, and the Beatles.

28.242 Piano Class III 4 Q. H.
This course will give students the opportunity to develop further facility acquired in Piano I and II through the study of more advanced works in the piano repertoire.

28.250 Music as a Listening Experience 4 Q. H.
This introduction-to-music course is listening oriented and has been designed to provide tools for the aural appreciation of music. No previous musical knowledge is required or assumed, and studies deal directly with compositions selected from the masterpieces of music. Organized according to the tenets of PSI (Personalized System of Instruction), the course allows the student to proceed at his or her own pace under the constant guidance and supervision of the instructor. Grades are determined by the number of units completed, and peer-tutor assistance is provided.

28.261 Music Therapy 4 Q. H.
The course examines the application of music as a therapeutic vehicle to release suppressed emotions, to encourage self-expression in psychiatric patients, and to treat a wide variety of disorders. Music therapy, in a modern approach to health services, is currently being considered as a supplement to shock and other treatments.

28.262 Music Therapy II 4 Q. H.
(Prereq. 28.261)

This course examines the etiologies, characteristics, and applications of music therapy with the physically handicapped, hearing impaired, visually impaired, learning disabled, emotionally

disturbed, speech/language impaired, and geriatric populations in one-to-one and group settings. In addition, improvisations and appropriate music materials for the non-musician and adapted instrument designs tailored to each disability are studied, while the correlation of music and movement is explored. Comparison of MT approaches (Bony, Levin, Nordoff, Robbins et al.), contributions of Orff, Kodaly, and Dalcroze, and discussion of assessment and accountability are included. Field trips to MT sites in and around Boston will be undertaken.

28.277 Voice Class I 4 Q. H.

Students will have the opportunity to learn the basic vocal production required for fine singing. Repertoire, both classical and contemporary, will be chosen for each student to learn and perform in lessons and before the entire class. Lectures will be given on the following subjects: diction, the physiology of singing, resonance, registers, and interpretation. Students will also study the basics of music reading and sight-singing. Some interpretation will be discussed, and recordings of the greatest vocal artists will be played for class analysis.

28.290 Directed Study 4 Q. H.

The focus of this course is independent work in a selected music area under the direction of one member of the Department. Enrollment is limited to qualified students only by special arrangement with the supervising faculty member and with the approval of the Department chairman.

93.160 American Musical Theatre 4 Q. H.

This interdisciplinary course, offered by the department of Drama and Music, traces the development of the American musical from *The Black Crook* to *A Chorus Line*. The role of musical theatre, as both entertainment and serious art form, is considered through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loewe, and Cole Porter are studied.

Drama

Note: See Speech Communication, 37.—, for courses in Speech Communication (formerly 29.—).

29.109 Speech for the Theatre 4 Q. H.
(Prereq. 37.110)

The course focuses on special speech problems confronting actors performing in classical and contemporary theatre.

29.120 Introduction to Theatre Arts 4 Q. H.
(For non-drama majors)

The course provides a brief view of the historical development of acting, directing, and production design. Emphasis is on appreciation of contemporary theatrical forms.

29.121 Theatre Appreciation 4 Q. H.

The course presents an introduction to the drama as a dynamic medium of human expression and to historical development of the

theatrical form. Included are reading and analysis of selected plays as they relate to form, genre, and style from the viewpoints of audience and artist.

29.122 Theatre Experience 4 Q.H.

The course offers an introduction to the theatre as a collaborative art form (theoretical and practical), with an emphasis upon acting, directing, designing, lighting, and the necessities of theatre economics.

29.124 Reader's Theatre 4 Q.H.

A study of the skills necessary to adapt, direct, and perform short stories and novels for public presentation, including how to select and work with materials for either educational and/or entertainment purposes.

29.130 Stage Makeup 4 Q.H.

The principles of, the reasons for, and the materials used in makeup for the theatre, television, and films. The practical application of types and styles of makeup—straight, old-age, character, and corrective—is also included.

29.135 Twentieth-Century European Theatre 4 Q.H.

The work of major European directors and designers who have attempted to develop viable alternatives to nineteenth-century realism. Exploration of the ideas and productions of such persons as Meyerhold, Brecht, Artaud, Grotowski, Vakhtangov, Piscator, Brook, and Svoboda.

29.136 The Theatre of Expanding Consciousness 4 Q.H.

The avant-garde theatre and its background in other arts as well as in society. The historical development of the avant-garde and some of its major themes are explored. An attempt is made to provide the student with the necessary background for discovering enjoyment and meaning in today's emerging theatre.

29.137 Image of Women in Western Drama 4 Q.H.

What is a woman? An examination of the way Western society, from the Greeks to the present day, has answered that question as revealed in its drama.

29.150 Acting I 4 Q.H.

(Prereq. Drama major or permission of instructor)

Fundamental techniques of stage use. The actor and the stage environment. Improvisations for strengthening imagination and increasing freedom. Analysis of scripts for work on performed scenes.

29.151 Acting II 4 Q.H.
(Prereq. 29.150)

Fundamental analysis of the script, including physicalizations and vocal scoring; character analysis; scenes performed for classroom analysis.

29.152 Acting III 4 Q.H.
(Prereq. 29.151)

Further development of the actor's tools, script and character scoring, exercises for physical and psychological freedom. In-class scenes from works in progress are included.

29.154 Rehearsal and Performance 4 Q.H.

Designed to allow the students to rehearse, perform, and produce a series of short dramatic works in which a variety of scripts and acting and directing concepts are explored under faculty guidance.

29.156 Body Movement I 4 Q.H.

(Prereq. Drama major or permission of instructor)

Students begin with simple Esalen physical awareness exercises, explore the warm-up process, and then try to find which exercises serve them best. Simple theatre games (i.e., machines, transformations, activity improvisations) are introduced, and students have the opportunity to learn how to relax through concentration on a specific mental task.

29.159 Theatre Games 4 Q.H.

This course offers a variety of basic dramatic, movement, and improvisational techniques that can be applied to theatrical, educational, and personal situations. Previous theatrical experience is not necessary.

29.160 Concepts of Direction 4 Q.H.

(Prereq. Drama major or permission of instructor)

Theories of dramatic presentation through analysis of selected historical developments. Purposes and techniques of theatrical direction as they relate to script analysis, production style, pictorial composition, rhythmic evolution, and empathic responses.

29.161 Problems in Direction 4 Q.H.

(Prereq. 29.160)

Experimentation in theory related to the staging of classical and modern drama. Analysis of plays in actual production: casting, rehearsals, character interpretations. Each student is responsible for the production of a one-act play.

29.164, 29.165, 29.166, 29.167 Practicum in Play Production (each) 1 Q.H.

Laboratory practice in technical theatre: scene building and painting; performing backstage functions. To be repeated for credit, up to four credits.

29.170 Stagecraft 4 Q.H.

Principles that underlie the coordination and execution of scenery for the stage; examination of different kinds of scenery, tools, equipment, construction materials, and techniques; handling of scenery and basic scene painting. Laboratory work: constructing and painting scenery for University productions.

29.172 Scenic Design for the Stage 4 Q.H.

(Prereq. 29.170)

Practical problems of scene design and methods of approach. Classwork and projects in analyzing a script in terms of visual requirements; elements of design and their applications to scenery; methods of inspiration; presentation of ideas including sketches, rendering, models, working drawings, and elevations; evaluation of designs. Laboratory work includes executing scenery for University productions.

29.173 Lighting Design for the Stage 4 Q.H.

(Prereq. 29.170)

Basic principles and practices of stage lighting, including the qualities and functions of light, lighting instruments and controls, basic electricity, color in light, and analysis of the script in terms of light requirements. Students are expected to develop light plots and schedules for various kinds of stage productions. Classwork includes laboratory work on lighting crews for University productions.

29.174 Scene Painting 4 Q.H.

The history of scene painting and ornament from classical to contemporary times. Studio organization, color, color theory, equipment, tools, materials, and costs involved with painting stage scenery. Projects and exercises in the use of different media, matching colors, painting of textures, light and shade, and the use of stencils and physical textures. Laboratory sessions include painting stage scenery for University productions.

29.175 Costuming I 4 Q.H.

The course presents the basic principles and ideals of costuming for the stage. Costume history is covered from prehistoric times through the Renaissance. Projects relate to historic periods covered.

29.176 Costuming II 4 Q.H.

(Prereq. 29.175 or permission of instructor)

A continuation of Costuming I. Lectures on costume history cover the seventeenth century through the early twentieth century. Projects relate both to the historic periods covered and to such theatrical forms as drama, ballet, opera, and musical comedy.

29.177 Basics of Theatre Design and Style 4 Q.H.

Visual style and ornamentation for the director, actor, designer, and audience. Examination is made of the script in terms of visual presentation. Work with the basics of design in relation to theatre and stage picture created by direction and design. Emphasis is on two-dimensional techniques of presentation based on psychology of color, line, and form and their effects on an audience. Graphic projects applying various media and techniques to achieve effect or style are included.

29.178 Theatre Crafts 4 Q.H.

An exploration of special effects and materials used for the theatre. Puppetry construction and staging. Building handprops, masks, and wigs.

29.179 Pattern Drafting and Costume Construction 4 Q.H.

Introduction to basic skills in simple pattern drafting and construction of basic garments. Lab work provides students an opportunity to acquire the knowledge and skills with which to design and adjust simple garments. Specifically designed for non-skilled beginners.

29.180 Playwriting I 4 Q.H.

The principles and practices of modern dramatic composition: characterization, plot, plot structure, dialogue, and other dramaturgical elements as seen in the one-act play. Included are the writing of brief scenes, the dramatic composition, and the one-act play.

29.181 Playwriting II 4 Q.H.

(Prereq. 29.180)

Continuation of 29.180.

29.182 Puppetry 4 Q.H.

A theoretical and practical survey of the art of puppetry. Utilizing a lecture/laboratory format, the history of puppetry is examined from prehistoric times through the present, and construction techniques for various styles of puppets are demonstrated and applied. The course covers shadow, hand, rod, hand-and-rod, bib, scarf, and marionette puppets.

29.185 Children's Theatre 4 Q.H.

Theories and methods of creative techniques related to children's programs in schools, churches, and recreational facilities. Analysis of literature in preparation for production of children's plays.

29.186 Educational Theatre 4 Q.H.

Drama and drama activities in community, social, health, and educational agencies. Organizing and directing young people's theatre programs are included.

29.200 Theatre History I 4 Q.H.

Development of the theatre and the drama of Greece and Rome, medieval Europe, Elizabethan and Restoration England, and seventeenth-century France; an examination of playwriting, acting styles, scene design, theatre architecture, and the relation among these elements.

29.201 Theatre History II 4 Q.H.

Development of the European theatre of the eighteenth, nineteenth, and twentieth centuries; growth and development of the proscenium theatre; the emphasis upon naturalistic and realistic presentation; and theatre innovations.

29.203 The Theatre of Ibsen, Strindberg, and Chekhov 4 Q.H.

Intensive study of the theatre of the three great masters of the naturalistic movement in Europe,

whose works stand as the foundation of modern drama.

29.204 Eastern European Theatre and Drama 4 Q.H.

A survey of the history of theatre and drama in Russia and Poland from the nineteenth century to the present. Emphasis will be placed upon the contributions of Polish romanticism, developments in the Soviet theatre of the 1920s, and on the work of major Polish and Russian dramatists and theatre artists, who have influenced Western theatre profoundly. (Course taught in English.)

29.205 The Restoration Theatre 4 Q.H.

The philosophical, social, historical, and critical influences upon the Restoration theatre and its dramatists.

29.207 New Trends in American Theatre 4 Q.H.

A survey of the evolution of theatre and drama in America during the 1960s and '70s. Developments in the commercial, the nonprofit, and the experimental fields will be examined.

29.208 The Irish Theatre 4 Q.H.

The course focuses on theatre and drama in Ireland from their beginnings to the present, with the backgrounds of Irish folklore and history. Particular emphasis on developments in the twentieth century.

29.210 The American Theatre 4 Q.H.

The course focuses on the American theatre from the Revolutionary War to the present.

29.211 The Theatre of Williams, Miller, and Albee 4 Q.H.

The course offers an intensive study of the works of three major post-World War II American playwrights.

29.212 Black Theatre in America 4 Q.H.

The course surveys the history of black theatre artists in America from the time of Ira Aldridge to the present day. Also examines the works of black playwrights from the Harlem Renaissance to the present, with an emphasis on the period beginning with Baraka's *Dutchman*.

29.213 Sexuality in the Drama 4 Q.H.

The course examines sexuality, homosexuality, deviant social behavior, and the trends toward and away from pornography in selected plays from Greek to contemporary theatre. Literary, critical, theatrical, and historical analysis.

29.214 Stage Management 4 Q.H.

The course examines the fundamental techniques of stage management in educational, community, and professional theatres and the working relations between stage managers and directing, acting, and technical personnel. The course includes the study of practical concepts of organizing and running performances, and a discussion of the philosophy of the stage

manager as a collaborative artist and crafts-person.

29.215 Stage Mechanics 4 Q.H.
(Prereq. 29.170)

This is a course in theatrical construction problem solving. Through a series of construction and material problems, the course focuses on advanced building and structuring techniques, materials, and organizational skills. A final project and presentation are required.

29.216 Period Scene Design 4 Q.H.
(Prereq. 29.172)

This course exposes students with some design experience to historic styles of architecture, interior design, and furniture. This knowledge is applied through theatrical design projects in specific historic periods and research projects on interior design styles.

29.217 Theatrical Drafting 4 Q.H.

By working on supervised classroom projects, the student is exposed to the basic graphic language needed to translate a designer's ideas into technical drawings used for construction. These basic skills can be used for future course work in design, University productions, and professional work.

29.218 Research for Theatrical Production 4 Q.H.

This course is an introduction to the background resources used in preparing theatrical production of both period and contemporary plays. The course covers means of using libraries, museums, and special collections to discover information about a play's historical context, the period in which it is set, major views of the text, and approaches employed in significant earlier productions.

29.230 Contemporary Theatre 4 Q.H.

The course examines the various forces that have shaped the major trends in Western theatre over the past two decades with emphasis upon selected works and contributions of Brecht, Bolt, Miller, Wilder, Baraka, Bullins, Horowitz, the major absurdist, and current experimentalists; examination of contemporary theatrical concerns with nudity, obscenity, homosexuality, and the special economic and artistic formulations of contemporary plays.

29.231 The Theatre of the Absurd 4 Q.H.

The course focuses on the theatre of the absurd as an anti-literary reflection of and reaction to life; its effects upon Western drama. Major concern with selected works and ideas of Jarry, Artaud, Camus, Sartre, Beckett, Genet, Ionesco, Pinter, Kopit, Brown, and Arrabal.

29.232 The Comic Theatre 4 Q.H.

The course focuses on the comic theatre from its beginnings in the ancient Greek theatre to its performances in contemporary theatre; an examination of the comic playwright, the comic

actor, the comic director—the synthesizing of the arts of the theatre to produce thoughtful as well as titillating laughter. Included are study of scripts by such playwrights as Aristophanes, Molière, Shaw, Neil Simon; techniques of Charlie Chaplin, the Marx Brothers, stand-up comics. Directional devices will be examined through lecture, film, records, and attendance at live performances.

29.233 Elizabethan Acting Styles 4 Q.H.
(Prereq. 29.151)

Through scene study and research involving notable production concepts, this course deals with Shakespeare's work and also handles other Elizabethan and Stuart dramatists. The course is structured as a problem-identification, problem-solving exercise.

29.234 Restoration and Eighteenth-Century Acting Styles 4 Q.H.
(Prereq. 29.151)

Problems encountered in plays of the Restoration and the eighteenth century are examined using various techniques including scene study.

29.235 Acting Styles for Twentieth-Century Nonrealistic Theatre 4 Q.H.
(Prereq. 29.151)

The plays of Beckett, Genet, Ionesco, Brecht, Albee, and others are examined specifically in light of the acting problems encountered by actors trained in an essentially naturalistic mode.

29.236 Special Topics in Acting and Directing 4 Q.H.

An in-depth examination of a subject of particular significance to the field.

29.237 Special Topics in Theatrical Design 4 Q.H.

An in-depth examination of a subject of particular significance to the field.

29.238 Special Topics in Theatre History—Dramatic Criticism 4 Q.H.

An in-depth examination of a subject of particular significance to the field

29.240 Drama Theory/Criticism 4 Q.H.

An examination of both the major historical statements of drama theory and contemporary drama criticism as evidenced in journalistic play reviews. Students are required to prepare reviews of local productions.

29.256 Body Movement II 4 Q.H.
(Prereq. 29.156)

The concentration-relaxation work is carried on in a more specific manner leading to an understanding of Michael Chekov's technique using body centers. Theatre games are also explored in more depth.

29.270 Theatre Management 4 Q.H.

Theatre management, including problems of financing, promoting, and programming for

educational, community, profit, and nonprofit professional theatre.

29.280 Senior Project in Drama 4 Q.H.
(Prereq. Drama majors only)

The student, working closely with an adviser, has the opportunity to develop a project that integrates the work pursued to date, and demonstrate his/her capacity to enter the professional theatre or to pursue graduate studies.

29.285 Drama and Movement Therapy 4 Q.H.

An exploration of teaching and rehabilitative methods, using the techniques of creative dramatics and dance/movement therapy. An emphasis will be placed on the exceptional child and on the physically and emotionally handicapped.

29.286 Rehabilitative and Theatrical Makeup 4 Q.H.

Use and application of makeup for corrective and rehabilitative purposes as well as for stage purposes. Special emphasis is on techniques utilized to enable physically deformed individuals to achieve a facial impression of the aesthetically normal and societally acceptable. For those interested in stage impressions, emphasis on three-dimensional constructions, prosthesis with latex, beards and moustaches.

29.290, 29.291, 29.292, 29.293
Directed Study (each) 4 Q.H.

29.295, 29.296, 29.297, 29.298 Junior-Senior Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

93.159 Introduction to Art, Drama, and Music 4 Q.H.

An introduction to the basic formal language of music, drama, and the visual arts. The course focuses on such formal elements as space, time structure, color, and interval by showing how these formal elements are, in effect, the "language" of the arts, and how they render intelligible a given art form. Lectures, discussions, and visits to museums and performances.

93.160 American Musical Theatre 4 Q.H.

An interdisciplinary course, offered by the departments of Drama and Music, in the development of the American musical as entertainment and serious art form, through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loewe, and Cole Porter are examined.

93.165 Humanistic Themes in the Arts 4 Q.H.

An examination of the way in which certain humanistic themes and topics have been interpreted through music, drama, and the visual

arts. The themes included are: "The Arts and Identity" and "The Arts and A View of the World," with focus on such topics as "The Arts

as Social and Political Commentary." Lectures, discussions, and visits to museums and performances.

English

Prerequisite for all English courses is a minimum of Freshman English courses (30.113 and 30.114) or equivalent. Please consult the English Department catalogue for more information on all courses listed. Topic courses change quarter to quarter.

30.100 Intensive English as a Second Language
Intensive review of English grammar to help students develop listening, speaking, reading, writing, and studying skills in the classroom, language laboratory, and small-group tutorials.

30.101 Fundamentals of English I 4 Q.H.
(Prereq. Special placement)

The course offers an introduction to principles of effective expository writing; emphasis on description, paragraph construction, and organization; review of the conventions of English usage, punctuation, and syntax; essay assignments.

30.102 Fundamentals of English II 4 Q.H.
(Prereq. 30.101)

Focus on exposition, argument, and academic essay writing; instruction in writing a research paper; continued emphasis on the conventions of English usage, punctuation, and syntax; essay assignments.

30.103 Grammar for Journalists 4 Q.H.
(Prereq. Journalism majors only)

Reviews the mechanics of newspaper and magazine prose; emphasis is on grammatical forms, punctuation, spelling, effective structures, and conventional usage; exercises and essay assignments.

30.104 Intermediate Writing 4 Q.H.
Provides writing instruction for students who wish to improve their writing skills; opportunity for students to develop their particular interests in subject matter and form.

30.105 Fundamentals of English for Non-native Speakers

(Prereq. Special placement) 4 Q.H.
Advances students' English language proficiency through reading comprehension drills, vocabulary development, oral presentations, and intensive practice, including grammar and mechanics. Introduces such college study techniques as note taking and basic library skills.

30.106 English for International Students I
(Prereq. 30.105 or special placement) 4 Q.H.

Emphasizes the importance of clearly stating and supporting a thesis in organized paragraph form. Focuses on short prose readings as examples of descriptive, narrative, and ex-

pository techniques. Writing and rewriting of short weekly essays required.

30.107 English for International Students II
(Prereq. 30.106) 4 Q.H.

Introduces literature study through close reading and discussion of fiction, nonfiction, and poetry. Continues development of rhetorical techniques by requiring weekly essays written in relation to the readings and rewritten to improve content, organization, and diction.

30.108 Creative Writing 4 Q.H.

Gives the beginning writer an opportunity to practice various forms of writing, both poetry and prose. Class discussion of student work.

30.110 Poetry 4 Q.H.

Extensive exercise in close reading of selected poems, study of critical terms, and practice in different critical approaches to poetry; examination of techniques for reading a variety of poetic texts; critical papers required.

30.111 Fiction 4 Q.H.

Close reading of selected novels and short stories, study of critical terms, practice in different critical approaches to fiction; critical papers required.

30.112 Drama 4 Q.H.

Close reading of selected plays, study of critical terms, practice in different critical approaches to drama; critical papers required.

30.113 Freshman English I 4 Q.H.

The course focuses on the individual student's writing skills. Included are application of important principles of logic and rhetoric to exposition and argumentation; review of sentence structure, punctuation, and paragraphing; extensive reading and analysis of the essay form; theme assignments.

30.114 Freshman English II 4 Q.H.
(Prereq. 30.113 or 30.101 and 30.102)

This course continues instruction in writing, with emphasis on expository methods of defining, describing, analyzing, persuading, and composing the research paper. Students write lengthy critical essays based on consideration of primary and secondary materials. Selections of poems, stories, and plays provide an introduction to literature and are the subject matter for discussion of writing technique and written assignments. 30.114 follows 30.113 and is required of all freshmen in the University.

30.115 Great Themes in Literature 4 Q.H.

Content determined by instructor, who chooses a theme and a number of illustrative works from different periods. Students are required to write critical papers, and are expected to develop techniques of research and documentation.

30.117 Topics in Fiction 4 Q.H.

Studies a particular kind of fiction, such as the novella; a problem in fiction, such as the role of the narrator; a particular group of fiction writers; or a theme in fiction.

30.118 Topics in Drama 4 Q.H.

Studies a particular kind of drama; a particular group of dramatists; or a theme in drama.

30.119 Topics in Poetry 4 Q.H.

Studies a particular kind of poetry, such as the sonnet or the dramatic monologue; a problem in poetry; a particular group of poets, such as the confessional poets; or a theme in poetry.

30.120 Introduction to Linguistics 4 Q.H.

Background in current linguistics. Diverse topics include the nature and origin of language, animal communication systems, prescriptive and descriptive grammar, language change, dialects, and language in literature. Reviews modern concepts of language structure: phonology, morphology, syntax, and semantics.

30.121 Foundations of the English Language 4 Q.H.

Studies the development of modern English from Anglo-Saxon beginnings; effects of Scandinavian and Norman invasions; dialect geography; evolutionary changes, word formation and borrowing; origins of writing and problems of spelling. Readings include both formal and informal writings, literary selections, wills, journals, and private and public letters.

30.122 Topics in Genre 4 Q.H.

Studies several genres concurrently; or studies, cross-generically, literary modes such as satire, pastoral, or melodrama; or studies a theme in a number of different genres.

30.125 Grammars of English 4 Q.H.

Designed for students seeking comprehensive knowledge of English grammar, this course provides a study of structure and usage in English according to traditional, descriptive, and generative (transformational) approaches.

30.126 Transformational Grammar 4 Q.H.

The theories of generative-transformational grammars by Noam Chomsky and others. The opportunity to develop the skill with which to construct and operate specific generative-transformational grammars.

30.130 Introduction to Semantics 4 Q.H.

The relation between language and behavior, levels of abstraction in communication, habits of evaluation of linguistic phenomena, and the modification of such habits in the direction of human understanding and survival.

30.131 Topics in Linguistics 4 Q.H.

Examines closely such topics as the application of linguistics to the study of literature, problems in semantics (e.g., language in law, language and social class), or problems in American dialects.

30.141 Science Fiction 4 Q.H.

The myths and rhetorical (scientific and pseudo-scientific), strategies of science fiction from Mary Shelley's *Frankenstein* through contemporary authors such as Vonnegut, Bradbury, Heinlein, and Clarke.

30.142 Psychology and the Novel 4 Q.H.

Concentration on twentieth-century novels whose themes stress individual behavior and motivation and whose form and style often try to imitate human mental and emotional processes. Includes novels by such writers as Kafka, Dostoevski, Faulkner, Conrad, and Lawrence.

30.146 Modern Bestseller 4 Q.H.

Explores the function of quest, romance, and adventure in a selection of contemporary, bestseller fiction by such authors as Hailey, Robbins, and Irving Wallace.

30.147 Topics in Science Fiction 4 Q.H.

Focuses on a single writer or group of writers (Wells or writers of contemporary American science fiction); a theme (women in science fiction or the future city); or a unifying idea (time travel or utopia/dystopia).

30.148 Sex Roles in Literature 4 Q.H.

Investigates the relation between sex roles, male and female, and literary portrayals. Selections represent male and female writers and provide a culturally comparative perspective. Readings include novels, plays, autobiographies, short stories, poems, as well as critical materials.

30.151 The Modern Novel 4 Q.H.

Studies the themes of important novelists of the twentieth century; analyzes styles, techniques, and trends in fiction; includes such authors as Joyce, Lawrence, Hemingway, Faulkner, and Bellow.

30.152 Modern Drama 4 Q.H.

Studies the development of drama since the late nineteenth century as a function of realism, naturalism, symbolism, and surrealism.

30.154 The Modern Short Story 4 Q.H.

The study of short-story writers with close attention to such figures as Poe, Joyce, Lawrence, Hemingway, and Oates.

30.155 Contemporary Fiction 4 Q.H.

British and American writers from 1945 to the present, including such figures as Britain's Lessing, Burgess, Amis, and Powell; and America's Pynchon, Vonnegut, Oates, and Barth. Emphasis is on the experimental and modernist authors.

30.156 Fantasy 4 Q.H.

Studies in the theory and practice of fantasy as found in the works of such authors as Swift, Carroll, Wells, and C. S. Lewis.

30.157 Topics in Fantasy 4 Q.H.

Explores such areas as dreams, nightmares, and borderline states of consciousness in the works of such writers as Poe, Tolkien, and Kafka.

30.158 Literature in Context 4 Q.H.

Attempts to place the writer in the context of a special theme. For example, the course might study a group of authors influenced by their common interest in psychoanalysis, by their social consciousness, or by an interest in the Wild West and the settlement of America.

30.159 Literature in Context 4 Q.H.

Similar to 30.158 but with different texts and contexts in a given year.

30.160 Topics in Literature 4 Q.H.

This course deals experimentally with subjects and themes such as heroes and villains, myth and folklore, fiction about war.

30.161 Topics in Literature 4 Q.H.

Similar to 30.160 but with different topics in given year.

30.162 Major Figure 4 Q.H.

Devoted entirely to the work of one writer. Specific writers vary widely and change frequently; for example, Mark Twain, Virginia Woolf, or Eugene O'Neill may be selected.

30.163 Major Figure 4 Q.H.

Similar to 30.162, but with concentration on a different writer in a given year.

30.164 Business Tradition in Literature 4 Q.H.

Examines the various literary images of the businessman as new frontier opportunities for the accumulation of wealth opened up. Biographies, autobiographies, novels, plays, and films are examined to study the many facets of these captains of industry and to determine their impact on society.

30.165 Literature and the Law 4 Q.H.

This course uses literature to investigate the problems of crime and justice as they occur throughout time, from ancient Greek tragedies to modern American novels. The readings may help the student to discover the changing nature of the criminal—hero or victim or villain—and to deal with the social, psychological, and political facts that define him/her.

30.166 Urban Life and Literature 4 Q.H.

This course examines the city in literature as it has been depicted from ancient times to the present. Such themes as the city as a locus of evil, the city as a place of possibility, and the city as a center of art and an influence on creative form are discussed. Works by Plato, Virgil, Juvenal, Addison, Fielding, Defoe, Balzac, Whitman, Melville, James, Howells, Crane, Joyce, Dreiser, Eliot, Dos Passos, West, Bellow, Malamud, and Barthelme, among others, may be included on the reading list. The purpose of the course is to provide the student an opportunity

to discover how an interdisciplinary approach to literature can be used critically—and how the city is a cultural resource, a subject of wonder, and a constant concern in literature.

30.167 Literature and Politics 4 Q.H.

Explores how authors from Sophocles to Mailer represent the religious, moral, and ethical conflicts arising from the acquisition, use, and misuse of political power. The literature falls into several categories: utopian, which establishes a conflict between the ideal and the real; satirical, which threatens a power structure by exposing it to scorn; analytic, which describes the rise to and fall from power of individuals, parties, or states; and investigative, which takes the reader inside a power elite to observe its inner operations. The course examines the difference between the ideal of government and its reality.

30.168 The Literature of Science 4 Q.H.

Examines the literary methods used by scientists to involve us in their experiences and discoveries. Many of the most creative minds of science have left literary works full of clarity, vigor, and emotive power. Explores a variety of these works from antiquity to the present to see how the creativity of the scientist is fundamentally the same as the creativity of the literary artist. Readings will be drawn from astronomy, physics, natural history, biology, mathematics, and psychology.

30.169 Film and Literature 4 Q.H.*

This course explores the ways in which film can transform the written word to a visual experience, and illustrates the way in which cinematic techniques help create and extend the meaning of that visual experience. Weekly screening sessions give students the opportunity to pursue and develop cinematic interests evolving from class discussions.

30.170 Survey of English Literature I 4 Q.H.

Surveys the major British writers and major literary forms and works from the Middle Ages to the end of the eighteenth century. Works by such writers as Chaucer, Spenser, Shakespeare, Milton, Pope, and Swift will be read and discussed.

30.171 Survey of English Literature II 4 Q.H.

Surveys the major British writers and major literary forms and works from the romantic period (c. 1800) to the mid-twentieth century. Works by such writers as Wordsworth, Keats, Browning, Yeats, Lawrence, and Eliot will be read and discussed.

30.175 Contemporary American Literature 4 Q.H.

The course explores the major literary movements and developments in American poetry and fiction from the Second World War to the present. Works by such writers as Lowell,

*Lab fee required.

Roethke, Plath, Pynchon, Barthelme, and Vonnegut will be read and discussed.

30.178 Shakespeare on Film 4 Q.H.*

This course examines the various treatments of Shakespeare's plays on film. It is concerned with the technical aspects of film and how these are used by directors to transfer Shakespeare's plays from the stage to the screen.

30.180 Survey of American Literature I

Surveys the major American writers and major literary forms and works from the colonial period to the Civil War. Works by such writers as Taylor, Cooper, Poe, Hawthorne, Melville, and Emerson will be read and discussed.

30.181 Survey of American Literature II

Surveys the major American writers and major literary forms and works from the Civil War to the mid-twentieth century. Works by such writers as Whitman, Dickinson, Twain, James, Hemingway, Fitzgerald, and Faulkner will be read and discussed.

30.182 American Novels I 4 Q.H.

Focuses intensively on the themes, forms, and techniques of the major American novelists of the nineteenth and early twentieth centuries, such as Cooper, Hawthorne, Melville, James, and Dreiser.

30.183 American Novels II 4 Q.H.

The course focuses intensively on the themes, forms, and techniques of modern American novelists such as Hemingway, Fitzgerald, Steinbeck, and Faulkner.

30.185 Topics in Film 4 Q.H.*

The course focuses on a movie genre (e.g., the western, the gangster film, the thriller), on a movie personality (e.g., an actor, writer, director), or on a theme (e.g., women in the movies).

30.186 Early American Literature 4 Q.H.

Examines American literature of the colonial and federal periods, including Bradford, Taylor, Edwards, Franklin, Irving, and Cooper.

30.187 New England Renaissance 4 Q.H.

Studies the development of a native tradition in the context of democratic and romantic attitudes toward experience and the paradox these attitudes reveal. Works by such writers as Emerson, Thoreau, and Melville will be read and discussed.

30.189 American Realism 4 Q.H.

Examines the realistic tradition in American literature, including local color and native humor, from the end of the Civil War to the turn of the century. Works by such writers as Twain, James, Howells, Crane, and Norris will be read and discussed.

30.190 Modern American Literature 4 Q.H.

Explores the major literary movements and developments in American poetry and fiction from the turn of the century to the Second World

War. Works by such writers as Anderson, Wharton, Fitzgerald, Faulkner, Frost, and Williams will be read and discussed.

30.191 Children's Literature 4 Q.H.

Studies the history of children's literature in the English language, with special attention to matters such as genre theory and critical approaches. Such works as *Alice in Wonderland*, *Uncle Remus*, *Little Women*, and *The Wizard of Oz* will be read and discussed.

30.192 Topics in Children's Literature 4 Q.H.

Focuses closely either on a specific collection of stories (e.g., *Grimm's Fairy Tales*), on a specific genre (e.g., boys' books), or on a problem of evil or children's literature as a form of group socialization.

30.193 Popular Culture 4 Q.H.

Surveys the development of popular culture in the United States as the living culture that arose in response to the development of a leisure-time market and the technology to reach it. The focus of the course is on the mass media, surveyed chronologically for evidence of trends arising from changes in popular taste and technology. Among the media to be discussed are popular literature, radio, and television.

30.194 Topics in Popular Culture 4 Q.H.

The course focuses on such topics as the soap opera, the western, the police story, etc.; on a popular culture activity; or on a popular culture perspective.

30.195, 30.196 Freshman English for Honors Students (each) 4 Q.H.

(Prereq. Special placement)
Equivalent of 30.113 and 30.114 for Honors Program Freshmen. Meets during winter and spring terms so that both science and non-science majors in the Honors Program can enroll together. See English Department course listing under 30.113, 30.114 for description.

30.200 Technical Writing I 4 Q.H.

This course is a composition elective to train writers for careers in technical writing. Course provides instruction in writing clear, unambiguous prose; describing processes; and researching published information through practice in writing memoranda, proposals, feasibility and program reports, and operation manuals.

30.201 Technical Writing II 4 Q.H.

(Prereq. 30.200 or permission of instructor)
This is a course in technical writing for students who wish to develop skills in a particular subject or form.

30.202 Writing for the Computer Industry 4 Q.H.

(Prereq. 30.200, or permission of instructor and one computer science course)
Focuses on computer documentation: general information, operating and programming instructions. Includes graphics, layout, testing, and revision.

30.203 Writing for the Professions:**Health Services****4 Q.H.**

This course is designed to serve the professional writing needs of students in the College of Nursing and the College of Pharmacy and Allied Health Professions through instruction in formal rhetoric and practice with a variety of professional forms: lab reports, clinical evaluations, medication analyses, and HEW proposals.

30.204 Advanced Writing**4 Q.H.**

(Prereq. 30.104 or permission of instructor)

A composition elective for experienced writers who wish to hone their skills; opportunity for students to develop their particular interests of subject and form.

30.205 Writing for the Professions:**Business Administration****4 Q.H.**

This course is designed to serve the professional writing needs of students in the College of Business Administration through instruction in formal rhetoric and practice with a variety of professional forms: letters, short memos, formal staff reports in the functional areas of accounting, personnel, marketing, finance, transportation, and insurance.

30.206 Freshman Technical Writing**4 Q.H.**

(Prereq. 30.113, 30.114)

This course is designed to serve the professional writing needs of students in the College of Engineering through instruction in formal rhetoric and examination of a variety of professional forms: description, analytical reports, systems design, lab reports, and proposal specifications.

30.207 Writing for the Professions:**Criminal Justice****4 Q.H.**

Designed to serve the professional writing needs of students in the College of Criminal Justice, this course offers instruction in formal rhetoric and practice with a variety of professional forms.

30.208 Poetry Workshop**4 Q.H.**

(Prereq. 30.108 or permission of instructor)

This is an advanced workshop course in writing and examining original student poetry. Students are expected to experiment in some established poetic forms of their own choosing and to produce their own original work.

30.209 Fiction Workshop**4 Q.H.**

(Prereq. 30.108 or permission of instructor)

This is an advanced workshop course in writing and examining original student fiction.

30.210 Major Early British Novelists**4 Q.H.**

The course surveys the early English novel by such authors as Defoe, Fielding, Smollett, Sterne, and Austen. The novels will be read and discussed to determine themes and charac-

teristics and to chart the development of the genre in the eighteenth century.

30.211 Major Nineteenth-Century British Novelists**4 Q.H.**

The course surveys the nineteenth-century English novel by such authors as the Brontës, Thackeray, Eliot, Meredith, and Hardy. The novels will be read and discussed to determine themes and characteristics and to chart the development of the genre in the nineteenth century.

30.212 Major Twentieth-Century British Novelists**4 Q.H.**

Surveys the twentieth-century English novel by such authors as Joyce, Lawrence, Woolf, and Durrell. The novels will be read and discussed with the goal of determining the characteristics and charting the development of the genre in the twentieth century.

30.213 English Drama I**4 Q.H.**

Surveys representative English drama, excluding Shakespeare, from the Towneley Cycle to Sheridan. The dramas will be read and discussed to determine themes and characteristics and to chart the development of the genre from its origins in England to the end of the eighteenth century.

30.214 English Drama II**4 Q.H.**

Surveys representative English drama of the nineteenth and twentieth centuries. The dramas will be read and discussed to determine themes and characteristics and to chart the development of the genre from the nineteenth century to the present.

30.215 Publication Arts**4 Q.H.**

This course is designed to acquaint students with basic publishing skills. Each student can choose an area of specialization, such as fiction, medicine, law, or engineering in order to develop skill in editing manuscripts.

30.218 Medieval English Literature**4 Q.H.**

Surveys the major works of medieval English literature. Works such as *Sir Gawain*, *Piers Plowman*, and *Pearl* will be read and discussed.

30.222 Chaucer**4 Q.H.**

Surveys the work of Chaucer, with particular emphasis on *The Canterbury Tales*.

30.223 Topics in Chaucer**4 Q.H.**

Examines closely a particular work or group of works (such as *Troilus and Cressida*) or a theme (such as Chaucer's symbolism).

30.225 Milton**4 Q.H.**

Concentration on Milton's *Paradise Lost*, with supplementary readings in his minor poetry and prose.

30.227 Topics in Medieval Literature**4 Q.H.**

The course focuses on such topics as a genre (e.g., romance or debate literature) or on a theme (e.g., alchemy or King Arthur).

- 30.228 Non-Fiction Workshop** 4 Q.H.
(Prereq. 30.104 or 30.108 or permission of instructor)
This is an advanced workshop course in writing with focus on such forms as short essays, reviews, and profiles.
- 30.230 Seventeenth-Century English Literature** 4 Q.H.
Examines major writers of the period, such as Bacon, Jonson, the metaphysical poets, Donne, Herbert, Dryden, and Milton.
- 30.231 Topics in Seventeenth-Century English Literature** 4 Q.H.
This course examines closely either a single writer or group of writers (e.g., Dryden or the metaphysical poets) or a topic (e.g., the flourishing of satire).
- 30.236 Eighteenth-Century English Literature** 4 Q.H.
Surveys the period; includes such major writers as Pope, Addison, Steele, Swift, Goldsmith, Burns, Johnson, and Boswell.
- 30.237 Topics in Eighteenth-Century English Literature** 4 Q.H.
Examines closely such topics as a single writer or group of writers (e.g., Swift or the essayists), a genre (e.g., satire), or a theme (e.g., reason and madness).
- 30.239 The Writing Process** 4 Q.H.
This course is designed primarily to provide substantial experiential and scholarly training for undergraduate tutors in the English Department's Writing Center.
- 30.240 Romantic Poetry** 4 Q.H.
Surveys the work of the major romantic poets: Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.
- 30.241 Victorian Literature** 4 Q.H.
Surveys the major literature of the period, from the works of Tennyson, Arnold, and Dickens to the works of G. M. Hopkins, Wilde, and the early writing of G. B. Shaw and Conrad.
- 30.242 Topics in Romantic Poetry** 4 Q.H.
This course examines closely a single writer or group of writers (e.g., the Keats-Shelley circles) or a theme (e.g., poetry and revolution or the creative process).
- 30.243 Topics in Victorian Literature** 4 Q.H.
Examines closely a single writer or group of writers (e.g., Wilde or the fantasists) or a theme (e.g., the movement toward modernism or decadence).
- 30.244 World Literature I** 4 Q.H.
Readings in world literature from the time of the Greeks through the Renaissance.
- 30.245 World Literature II** 4 Q.H.
Readings in world literature from the Renaissance through the modern period.

- 30.246 Twentieth-Century English Literature** 4 Q.H.
Surveys the major literature of the period, including such writers as Shaw, Beckett, Yeats, T. S. Eliot, Auden, Conrad, Joyce, Lawrence, Greene, Lessing, Murdoch, and Fowles.
- 30.247 Topics in Twentieth-Century English Literature** 4 Q.H.
Examines closely the work of a single author or group of authors (e.g., Lawrence or post-war authors) or a topic (e.g., forms of modernism or imperialism).
- 30.248 Sixteenth-Century Literature** 4 Q.H.
Concentration on sonnets, love lyrics, and erotic narrative poetry, principally by Wyatt, Sidney, Marlow, and Shakespeare.
- 30.249 Masterpieces of World Literature** 4 Q.H.
Includes a selection of "great books," primarily by non-English authors, that have been central to the development of Western thought and culture.
- 30.250 Shakespeare's Comedies** 4 Q.H.
Studies the romantic comedies, problem comedies, and comedies of regeneration, ranging from *The Merchant of Venice* to *The Tempest*.
- 30.251 Shakespeare's Tragedies** 4 Q.H.
Studies the nature of the tragic hero, the questioning of social norms, and the landscape of chaos, ranging from *Julius Caesar* to *King Lear*.
- 30.252 Topics in Shakespeare** 4 Q.H.
Examines closely such topics as the history plays, Shakespeare in performance, the Shakespearean hero, and psychological approaches to Shakespeare.
- 30.253 Introduction to Shakespeare** 4 Q.H.
The course covers a selection of the major plays of Shakespeare, including both tragedies and comedies.
- 30.254 Backgrounds in English and American Literature** 4 Q.H.
Readings in translation of Greek, Roman, and biblical literature as background for literary study. Emphasis on the development of myth, genre, and theme. Readings will include, among others, Homer, Virgil, Ovid, the most influential parts of the Bible, and Dante.
- 30.255 Topics in Writing: Reading and Writing Non-Fiction** 4 Q.H.
A combination of literary analysis and creative writing. Concentration on subjects of twentieth-century non-fiction prose such as politics, science, "culture," athletics, and natural history. Among authors who might be considered: Elizabeth Drew, Russell Baker, Stephen Jay Gould, Louise Thomas, John McPhee, Roger Angell, David Halberstam, Joseph Wood Krutch, and John Hay.

- 30.260 The Bible** 4 Q.H.
Study and analysis of selected books of the Bible. Texts are considered in their historical and literary contexts.
- 30.262 Approaches to Literature** 4 Q.H.
Exercises and readings in ancient and modern theories of literature. Included are Marxist, Freudian, Jungian, and New Critical theories, as well as selections from the criticism of Plato, Aristotle and the Romantics.
- 30.263 Modern Poetry** 4 Q.H.
Studies the origin and development of the modern tradition in poetry, its form and subject matter; includes such writers as Yeats, Hardy, Frost, Eliot, and Stevens.
- 30.264 Topics in Modern Poetry** 4 Q.H.
Focuses on a particular theme such as the poet's use of the past, his/her role in politics, a particular problem in modern poetry, or a particular group of modern poets.
- 30.266 Myth and Archetype in Literature** 4 Q.H.
Studies twentieth-century theories of myth and archetype as they have influenced our understanding and analysis of works of literature.
- 30.272 Studies in English Literature I** 4 Q.H.
A seminar on a special topic in English literature, such as color symbolism in literature or John Donne and the metaphysical poets.
- 30.273 Studies in English Literature II** 4 Q.H.
Continuation of 30.272.
- 30.274 Studies in American Literature I** 4 Q.H.
Studies a special topic in American literature, such as the genteel tradition or American humor.
- 30.275 Studies in American Literature II** 4 Q.H.
Continuation of 30.274.
- 30.277 Topics in Literary Criticism** 4 Q.H.
Studies a particular problem, method, or school of criticism, such as structuralism, mythopoeic, or archetypal criticism.
- 30.279 Contemporary Poetry** 4 Q.H.
Focuses primarily on British and American poetry since World War II. Includes such writers as Roethke, Plath, Olson, Ammons, Hughes, and Larkin.
- 30.280, 30.281 Junior-Senior Seminar** (each) 4 Q.H.
(Open to all upperclass students in the College of Arts and Sciences; first preference is given to those needing the course to complete the major). The upperclass student with a strong competence in the humanities will have the chance to devise, pursue, and develop a response to an important issue in literature (e.g., the writer and the audience, the tradition of the new, style and meaning in literature, and literature and society). Class-time emphasis will be on discussing the broader implications of the issue dealt with by the seminar, as well as on presenting independent research toward the end of the quarter. The role of the instructor will be that of moderator, research resource, and guide, rather than that of lecturer.
- 30.290, 30.291 Directed Study** (each) 4 Q.H.
- 30.295, 30.296, 30.297, 30.298 Junior-Senior Honors Program** (each) 4 Q.H.
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Modern Languages

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. If approved by the Department of Modern Languages and the Dean's Office, equivalent course work done elsewhere may be considered acceptable to satisfy these prerequisites.

The courses described immediately below are given in *English*, and no knowledge of a foreign language is required to take them. For language majors interested in obtaining major credit for any of these courses, please consult your instructor.

31.217 French Literature in Translation 4 Q.H.
An elective course for all students, offering a study of some of the most significant works of French literature in translation.

31.252 The Theme of Solitude in French Literature 4 Q.H.
Course conducted in English. Texts read in English translation (those who wish to do so may read them in French). The multiple facets of the theme of solitude traced from the beginnings of French literature to that of the

present. Viewed as both a source of wonder and anguish, solitude studied in its various manifestations, including banishment, imprisonment, expatriation, and seclusion. The phenomena of moral and spiritual solitude are examined as well. Authors studied include Charles d'Orleans, Du Bellay, Rousseau, Chateaubriand, Hugo, Verlaine, Mauriac, and Camus.

31.255 Masterpieces of Modern European Fiction 4 Q.H.
This course is conducted in English and focuses on modern European authors, including Dostoevski, Mann, Kafka, Proust, Gide, and Camus. Their works are viewed as commentaries on their respective societies and, more generally, as investigations of the human condition.

31.282 French Seminar: Voltaire and Rousseau**4 Q.H.**

This course offers an opportunity to study and compare the two great figures of the eighteenth century. Through an analysis of their works, students have the opportunity to determine how, by their contrasting interests, personalities, and views of society, these writers contributed to fundamental changes in the political, philosophical, and literary world of their time—and ours. Class discussion, oral and written reports. Conducted in English. Offered in alternate years.

32.215 Backgrounds in Hispanic Culture I**4 Q.H.**

A multimedia approach is utilized to present the rich panorama of the humanities from Altamira to modern times. A reading knowledge of Spanish is helpful but not required, since the course is conducted in English. Field trips, concerts, guest speakers, and individual study projects enhance this exploration of Spanish creativity.

32.216 Backgrounds in Hispanic Culture II**4 Q.H.**

This course spans the time from pre-Columbian days to the present in Latin America, exploring culture, traditions, and attitudes. A multimedia approach with field trips and guest lecturers. Conducted in English.

32.217 Saints and Sinners: The Vision of Women in the Middle Ages and the Renaissance**4 Q.H.**

Topics include the attainment of and the atonement for love; society's changing attitude toward women as reflected in the literature of the times. Selected fabliaux, short stories, poems, and plays from Boccaccio, Chaucer, Ruiz, Rojas, Machiavelli, Lope de Vega, Calderon, Quevedo, Racine, Middleton, as well as women writers. Reference is made to historical and sociological materials. This course is offered in English. All required readings are in translation.

34.215 Backgrounds in Russian Culture**4 Q.H.**

Designed to offer the student a view of Russian culture and civilization, the course utilizes guest speakers, films, field trips, and discussions. Conducted in English.

34.217 The Works of Alexander Pushkin in**Translation****4 Q.H.**

The course offers a survey and analysis in English of Alexander Pushkin's artistic prose, lyric poetry, correspondence, friendships, and major literary influences.

34.218 Russian Literature in Translation**4 Q.H.**

A companion to 34.217, this is a survey and analysis in English of some of the works of Tolstoi, Dostoevski, Chekhov, and others.

35.217 The Works of Dante in**Translation I****4 Q.H.**

This course considers briefly the cultural background and various literary schools that in-

fluenced Dante. His life, his character, and his minor works are discussed. The *Vita Nuova* and the first cantica of the *Divina Commedia*, the "Inferno," are read and analyzed in some detail. This course is intended for students of any background or major. Bilingual texts will be used so that students with a background in Italian may refer to the original for added interest and enrichment. Classes are conducted in English.

35.218 The Works of Dante in**Translation II****4 Q.H.**

Continuation of 35.217, but may be taken separately. The other two parts of the *Divina Commedia*, "Purgatorio" and "Paradiso," are studied in detail. The course is open to anyone. Bilingual texts used. Classes conducted in English.

35.280 Italian Seminar: Pirandello**4 Q.H.**

By viewing reality and human personality with strikingly new insights, Pirandello contributed a new dimension to our understanding of human nature and brought about significant changes to the traditional conception of the theatre. We will examine the originality and art of Pirandello by a close study of some of his great plays and short stories. Class discussions, oral and written reports. Conducted in English. Offered in alternate years.

French**31.201 Elementary French I****4 Q.H.**

Designed for students with very little or no prior knowledge of French, this course provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations, aims at good pronunciation and ease in response. Each lesson incorporates helpful information about daily life in France and the varied cultures within the world of French speakers. Laboratory practice complements classwork, enables students to work aloud at their own speed, reinforces their acquisition of essential structures, and acquaints them with a vast library of audio-visual resources.

31.202 Elementary French II**4 Q.H.**

(Prereq. 31.201)

This course's intent is to continue and broaden beginners' exposure to the "four skills"—oral comprehension, speaking, reading, and writing French—so that the linguistic tools needed to understand and function in foreign contexts—at home, abroad, and in the world of literature and film—may be acquired.

31.203 Intermediate French I**4 Q.H.**

(Prereq. 31.202 or equiv.)

This course, for students who wish to further their audio-lingual skills and improve their read-

ing and writing, combines a review and continued study of grammar essentials with oral, writing, and language laboratory practice. Varied readings include journalistic, cultural, and modern literary texts. Classes are conducted in French as much as possible so that students may exercise their new skills.

31.204 Intermediate French II 4 Q.H.
(Prereq. 31.203)

This course uses the fundamentals of French to promote effective self-expression through speaking and writing and to explore the idiomatic aspects of the language. Through progressive class discussions and oral and written commentaries, students analyze a contemporary French novel or a French cultural reader, screenplay, or collection of short stories. The course strives first, to help students read and comprehend modern French writing with confidence, and to be able to talk and write about it in good French; and second, to provide them the opportunity to prepare for advancement to courses beyond the intermediate level.

31.205 Reading French in the Arts and Sciences 4 Q.H.
(Prereq. 31.202 or equiv.)

This course is designed for those students who wish to develop their reading skills, without regard to other aspects of the language such as speaking or writing. To this end, the grammar necessary for reading is stressed, together with vocabulary building. Scientific and nonscientific texts are read. This course may also provide assistance to students, graduate and undergraduate, who need to pass a reading examination to fulfill specific degree requirements. However, it should be made clear that this course is not a substitute for 31.203 or 31.204 (Intermediate French).

31.215 Introduction to the French-Speaking World 4 Q.H.
(Prereq. 31.204 or equiv.)

This course offers a cultural introduction to the French-speaking world through the study of various reading selections in the textbook *Le Monde Francais*. These selections, which stress vocabulary building and proper usage of a wide variety of grammatical forms, deal with the traditional backgrounds and aspects, as well as the contemporary and "pop" aspects, of the cultural heritage of the world's French speakers. France will be the main, but not the exclusive, focus of this course.

31.217 Modern Philosophical French Literature in Translation 4 Q.H.

Camus and Sartre are considered to have been the spokesmen for their generation's philosophical concerns. Works by these two authors are studied in the course and a working

knowledge of existentialism is developed from them. Course given in English.

31.227 French Composition and Conversation I 4 Q.H.

This course is designed for qualified students who wish to work on improving their proficiency in speaking and writing French through oral reports, class discussions, compositions, and an advanced review of fundamentals. Grammar work focuses on the students' particular needs as well as the nuances of the language. Varied readings in a range of styles—popular to literary—provide insight into French life and culture. Conducted in French.

31.228 French Composition and Conversation II 4 Q.H.
(Prereq. 31.227 or equiv.)

A continuation of French 31.227, with emphasis on individual work, oral presentations, discussions, related grammar, and analysis of readings. Conducted in French.

31.229 Advanced French Proficiency I 4 Q.H.
(Prereq. 31.227 and 31.228 or equiv.)

Emphasis is on further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion of articles from current periodicals. Special attention is given to the latest trends in spoken French, the study of idioms and proverbs, as well as selected examples of "argot" (slang).

31.230 Advanced French Proficiency II 4 Q.H.
(Prereq. 31.227 and 31.228 or equiv.)

This course is the continuation of 31.229. In addition to further study in the areas covered in course 31.229, each student is expected to pursue one major project throughout the course, to be completed at the end of the quarter—such as planning and writing an original French magazine with one article to be submitted each week of the term.

31.231 Masterpieces of French Literature I 4 Q.H.
(Prereq. 31.204 or equiv.)

This course provides an introduction to French poetry, theatre (both comedy and tragedy), novels, and autobiographies through the study of key works from the Middle Ages and Renaissance through the Age of Enlightenment. The course includes such writers as Villon, Moliere, Racine, Voltaire, and Rousseau. The course, conducted largely in French, aims to acquaint students with a critical approach to reading; to help them improve their reading, speaking, and writing skills; and to apply these new skills to a greater understanding and appreciation of major French contributions to Western culture. Group discussions are encouraged in an effort to bring out the relation between the texts and contemporary issues.

31.232 Masterpieces of French Literature II**4 Q.H.**

(Prereq. 31.204 or equiv.)

A continuation of 31.231, which is not necessarily a prerequisite. The course presents some of the most interesting and significant works of literature from the Romantic Age to the present. Among the readings are an "existential" play by Musset, poetry by Baudelaire and Verlaine, and fiction by Flaubert, Camus, and Robbe-Grillet. For a description of methodology, see 31.231.

31.243 French Literature in the Splendid Century**4 Q.H.**

(Prereq. 31.232 or equiv.)

This course presents a study of the nondramatic literature of seventeenth-century France from the baroque through the classical periods. The course studies a rich and diverse body of writing encompassing philosophy, poetry, the table, the novel, and epistolary writing. Among the authors treated are Descartes, Pascal, La Rochefoucauld, La Fontaine, Boileau, Mme. de Sevigne, and Mme. de La Fayette. Offered every other year.

31.244 French Theatre in the Splendid Century**4 Q.H.**

(Prereq. 31.232 or equiv.)

This course offers a study of the dramatic literature of seventeenth-century France, from the baroque through the classical periods. Tragedy is studied in the works of Corneille and Racine; comedy, in those of Moliere. Offered every other year.

31.245 French Literature of the Eighteenth Century I**4 Q.H.**

(Prereq. 31.232 or equiv.)

The eighteenth century in France, known as the Age of Enlightenment, was an age of challenge to established authority in all areas, and an age of changing ideas and ideals. This intellectual and political vitality is reflected in the representative works of Marivaux, Montesquieu, Prevost, and Voltaire. Class discussions, oral and written reports. Conducted in French, but English is allowed. Offered every other year.

31.246 French Literature of the Eighteenth Century II**4 Q.H.**

(Prereq. 31.232 or equiv.)

Toward the latter half of the century we begin to see both the achievements brought about by the spirit of enlightenment and at the same time the awakening of the romantic sensibility, particularly in such authors as Diderot, Rousseau, St. Pierre, Laclos, and Beaumarchais. Class discussions, oral and written reports. Conducted in French, but English is allowed. Offered in alternate years.

31.247 French Literature of the Nineteenth Century I**4 Q.H.**

(Prereq. 31.232 or equiv.)

Romanticism is treated as a major cultural phenomenon affecting man's view of his world and the way he expresses experience. In this context, the course examines romanticism in poetry and drama, as well as its continuation into the realist novel. Among the authors read are Victor Hugo in poetry and the drama, and Honore de Balzac in the novel. In addition there are selections from other writers who represent aspects of romanticism and realism. Conducted principally in French. Offered every other year.

31.248 French Literature of the Nineteenth Century II**4 Q.H.**

(Prereq. 31.232 or equiv.)

This course deals with the reaction against romanticism: aestheticism and personal modes of expression in contrast to the enthusiasm of the early romantics. The course deals with a novel by Gustave Flaubert and the verse of Charles Baudelaire in *Les Fleurs du Mal*, and the poets who followed in Baudelaire's footsteps. Flaubert and Baudelaire are seen as precursors of modern literature. Conducted principally in French. Offered every other year.

31.249 French Literature of the Twentieth Century I**4 Q.H.**

(Prereq. 31.232 or equiv.)

This course offers a study of the major movements in the narrative and dramatic prose writers prior to World War II, including Alain-Fournier, Proust, Claudel, Gide, Mauriac, and Saint Exupéry. Students are required to read a work from each author, discuss it in class, and present oral and written reports. Conducted in French, but English may be used. Offered in alternate years.

31.250 French Literature of the Twentieth Century II**4 Q.H.**

(Prereq. 31.232 or equiv.)

This course focuses on the trends in postwar fiction, with particular consideration of the struggle to find meaning in an absurd world. Analysis of significant works by Giraudoux, Montherlant, Sartre, Camus, Anouilh, Ionesco, and Beckett. Oral and written reports, class discussions. Conducted in French, but English may be used. Offered in alternate years.

31.252 The Theme of Solitude in French Literature**4 Q.H.**

Course conducted in English. Texts read in English translation (those who wish to do so may read them in French). The multiple facets of the theme of solitude are traced from the beginnings of French literature to the present. Viewed as a source of both wonder and anguish, solitude is studied in its various manifestations, including banishment, imprisonment, expatriation, and seclusion. The phenomena of

moral and spiritual solitude are examined as well. Among authors studied are Charles d'Orleans, Du Bellay, Rousseau, Chateaubriand, Hugo, Verlaine, Mauriac, and Camus.

31.255 Masterpieces of Modern European

Fiction 4 Q.H.

This course is conducted in English and focuses on modern European authors, including Dostoevski, Mann, Kafka, Proust, Gide, and Camus. Their works are viewed as commentaries on their respective societies and, more generally, as investigations of the human condition.

31.280 Seminar: Critical Methodology and Practice in French Literature

4 Q.H.

(Prereq. Excellent reading knowledge of French) The seminar treats one modern French writer in terms of a critical methodology developed in the first part of the seminar based on modern critical practice.

31.281 Seminar: Trends in Modern French Literature

4 Q.H.

(Prereq. Excellent reading knowledge of French) The seminar examines a trend in modern French literature and develops a critical methodology useful for this analysis.

31.282 French Seminar: Voltaire and Rousseau

4 Q.H.

This course offers an opportunity to study and compare the two great figures of the eighteenth century. Through an analysis of their works, students may determine how, by their contrasting interests, personalities, and views of society, these writers contributed to fundamental changes in the political, philosophical, and literary world of their time—and ours. Class discussion, oral and written reports. Conducted in English. Offered in alternate years.

31.290, 31.291, 31.292, 31.293, 31.294 Directed Study

(each) 4 Q.H.

Directed Studies offer students a way of going beyond work given in the regular curriculum and may also serve as a means to complete major or minor requirements in certain situations. Directed Studies will not be given in areas adequately covered by existing courses. Priority is given to language majors and to juniors and seniors.

31.295, 31.296, 31.297, 31.298 Junior-Senior

Honors Program

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Spanish

Prerequisites listed for Modern Languages are based on current course numbers at North-eastern. Equivalent course work done elsewhere

may be considered acceptable to satisfy these prerequisites.

32.200 Intensive Spanish

8 Q.H.

This course encompasses the same material covered in 32.201 and 32.202. Students with language-learning ability and a commitment to the study of foreign languages are encouraged to take the course. Students are expected to assimilate the material at an accelerated pace. This is a two-sequence course; students *must* enroll in *both* sequences. Satisfactory completion of this course enables the student to take 32.203 if he/she wishes.

32.201 Elementary Spanish I

4 Q.H.

The course includes presentation of essentials of correct usage through acquisition of basic skills in reading, writing, speaking, and aural comprehension.

32.202 Elementary Spanish II

4 Q.H.

(Prereq. 32.201 or equiv.)

Continuation of language instruction with increasing attention to vocabulary and skills relevant to persons who wish to become involved with the Hispanic world.

32.203 Intermediate Spanish I

4 Q.H.

(Prereq. 32.202 or equiv.)

Included are completion of basic grammatical usage. Reading of contemporary Hispanic plays; oral and written communication based upon assigned readings.

32.204 Intermediate Spanish II

4 Q.H.

(Prereq. 32.203 or equiv.)

The course offers intensive reading of topics of current interest; conversation practice utilizing skills acquired in previous course work; and composition practice based upon varied assigned topics.

32.209 Conversational Spanish I

4 Q.H.

(Prereq. 32.204 or equiv.; open to non-majors only)

Emphasis is on helping students develop the ability to speak and comprehend Spanish. Particularly able students may be accepted after having completed only 32.203. In this case, 32.209 may be used to satisfy the language requirement.

32.210 Conversational Spanish II

4 Q.H.

(Prereq. 32.209 or equiv.; open to non-majors only)

Continuation of 32.209, with continuing emphasis on the development of oral facility in Spanish. Particularly able students may be accepted after having completed only 32.204.

32.215 Backgrounds in Hispanic Culture I

4 Q.H.

A multimedia approach is utilized to present the rich panorama of the humanities from Altamira to modern times. A reading knowledge of Spanish is helpful but not required, since the course is conducted in English. Field trips, concerts, guest speakers, and individual study

projects enhance this exploration of Spanish creativity.

32.216 Backgrounds in Hispanic Culture II 4 Q.H.
This course spans the time from pre-Columbian days to the present in Latin America, exploring culture, traditions, and attitudes. A multimedia approach with field trips and guest lecturers. Conducted in English.

32.217 Saints and Sinners: The Vision of Women in the Middle Ages and the Renaissance 4 Q.H.
Topics include the attainment of and the atonement for love; society's changing attitude toward women as reflected in the literature of the times. Selected fabliaux, short stories, poems, and plays from Boccaccio, Chaucer, Ruiz, Rojas, Machiavelli, Lope de Vega, Calderon, Quevedo, Racine, Middleton, as well as women writers. Reference is made to historical and sociological materials. This course is offered in English. All required readings are in translation.

32.227 Spanish Composition and Conversation I 4 Q.H.
(Prereq. 32.204 or equiv.)

This course offers practice in writing and speaking Spanish, including written and oral resumes, prepared speeches and themes, and impromptu speaking and writing. A review of the more subtle problems of grammar.

32.228 Spanish Composition and Conversation II 4 Q.H.
(Prereq. 32.227 or equiv.)

This course offers further practice in oral and written Spanish; continued study of problems of advanced Spanish grammar.

32.229 Advanced Spanish Proficiency I 4 Q.H.
(Prereq. permission of instructor)

This course is designed for those preparing to enter the teaching profession, as well as qualified advanced students. Advanced elements of Spanish syntax, with emphasis upon achieving superior speaking, reading, and writing skills.

32.230 Advanced Spanish Proficiency II 4 Q.H.
(Prereq. 32.229 and permission of instructor)
Continuation of aims and goals of 32.229.

32.231 Masterpieces of Spanish Literature I 4 Q.H.
(Prereq. 32.204 or equiv.)

An introductory course tracing the development of Spanish literature from its beginnings in the Middle Ages (las jarchas, *El poema del Cid*, *El libro de buen amor*, *La Celestina*, etc.) through the Renaissance and Baroque periods or Golden Age (Garcilaso de la Vega, the picaresque novel, the mystics, Cervantes, Lope de Vega, Calderon, etc.). Classes are conducted in Spanish.

32.232 Masterpieces of Spanish Literature II 4 Q.H.
(Prereq. 32.204 or equiv.)

A continuation of 32.231, surveying the literature of eighteenth-, nineteenth-, and twentieth-century Spain. Included are the literary movements of romanticism, realism, and the generation of '98. Classes are conducted in Spanish.

32.239 Spanish Literature of the Middle Ages 4 Q.H.
(Prereq. 32.232 or equiv.)

The course offers selections from the major works of the Middle Ages, from *El Poema del Cid* to the *Libro de buen amor*. Conducted in Spanish.

32.241 Spanish Literature of the Fifteenth and Sixteenth Centuries 4 Q.H.
(Prereq. 32.232 or equiv.)

This course examines selections from the major works of the fifteenth and sixteenth centuries. Some of the works to be considered are *La Celestina*, *Lazarillo de Tormes*, and *El Roman-cero*. Conducted in Spanish.

32.243 Cervantes and His Times 4 Q.H.
(Prereq. 32.232 or equiv.)

The course examines selections from Cervantes' minor works (the *Entremeses* and the *Novelas ejemplares*); emphasis, however, is on *Don Quixote*, Spain's greatest literary masterpiece. Conducted in Spanish.

32.244 Spanish Golden Age Theatre 4 Q.H.
(Prereq. 32.232 or equiv.)

The course examines plays by the outstanding dramatists of the seventeenth century: Lope de Vega, Calderon de la Barca, Tirso de Molina, Ruiz de Alarcón, and others. Conducted in Spanish.

32.247 Spanish Literature of the Nineteenth Century I 4 Q.H.
(Prereq. 32.232 or equiv.)

The course includes readings in the prose, poetry, and drama of the romantic period, including selections from el Duque de Rivas, Larra, Espronceda, Zorrilla, and Becquer. Conducted in Spanish.

32.248 Spanish Literature of the Nineteenth Century II 4 Q.H.
(Prereq. 32.232 or equiv.)

This course offers a study of some of the major novelists of the second half of the nineteenth century, such as J. M. de Pereda, Juan Valera, Emilia Pardo Bazan, and B. Perez Galdos. Conducted in Spanish.

32.249 Spanish Literature of the Twentieth Century I 4 Q.H.
(Prereq. 32.232 or equiv.)

The course examines selections from the writings of the Generation of '98: Unamuno, Valle-Inclán, Pío Baroja, Benavente, Azorín, and the Machado brothers.

32.250 Spanish Literature of the Twentieth Century II**4 Q.H.**

(Prereq. 32.232 or equiv.)

The course focuses on prose and poetry of modern writers, such as Ortega y Gasset, Perez de Ayala, Garcia Lorca, Juan Ramon Jimenez, Gironella, and Jose Cela.

32.251 Latin American Literature**4 Q.H.**

(Prereq. 32.232 or equiv.)

The course focuses on early Latin American literature: the literature of the colonial period and the early nineteenth century, based primarily on selections from an anthology.

32.252 Latin-American Literature**4 Q.H.**

(Prereq. 32.232 or equiv.)

This course focuses on modern Latin American literature; readings from nineteenth- and twentieth-century prose and poetry.

32.280 Spanish Seminar**4 Q.H.**

This course is designed primarily for majors who have progressed to the upper-level literature courses in Spanish. However, nonmajors who show exceptional background may be admitted with the instructor's permission. The course focuses upon a narrowly defined theme (i.e., a single author, a single work, or a single theme), which students are asked to explore in depth; students are expected to present a final paper based upon individual research.

32.281 Seminar in Spanish Literature**4 Q.H.**

(Prereq. Permission of instructor)

This is an upper-level literature course designed primarily for majors, although nonmajors who show exceptional background in Spanish may be admitted. Students are expected to read a selected group of Galdos' novels, and the class meetings will concentrate on a detailed discussion and analysis of the works read. There are collateral readings as well, and a final paper on a topic to be selected by the student.

32.282 Seminar in the Contemporary Spanish Theatre**4 Q.H.**

(Prereq. 32.232 or permission of instructor)

In contrast to the typical bourgeois theatre of consumption in Spain, there exists a number of dramatists committed to revealing the tragic social and existential aspects of the human condition. Emphasis is placed on authors such as Vallejo, Sartre, the members of the *generacion realista*, and the "underground" playwrights. Classes are conducted in Spanish. Class participation as well as oral and written projects required. Alternates yearly with 32.281.

32.290, 32.291, 32.292, 32.293, 32.294 Directed Studies**(each) 4 Q.H.**

Directed Studies offer students a way of going beyond work given in the regular curriculum and may also serve as a means to complete major or minor requirements in certain situations.

Directed Studies will not be given in areas adequately covered by existing courses. Priority is given to language majors and to juniors and seniors.

32.295, 32.296, 32.297, 32.298 Junior-Senior Honors Program**(each) 4 Q.H.**

For prerequisites and other details, see the section on the Junior-Senior Honors Program page 1.

German

Prerequisites listed for Modern Languages are based on current course numbers at North-eastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

33.201 Elementary German I**4 Q.H.**

This course is designed to provide instruction in the basic grammatical structure of German through practice in listening comprehension, speaking, reading, and writing. Instruction is provided in the classroom and in the language laboratory. No previous study of German necessary. (Special sections of this course are run for business students.)

33.202 Elementary German II**4 Q.H.**

(Prereq. 33.201 or equiv.)

A continuation of 33.201, this course emphasizes helping students to increase their knowledge of the basic grammatical structure of German and to develop additional flexibility in the four language skills. (Special sections of this course are run for business students.)

33.203 Intermediate German I**4 Q.H.**

(Prereq. 33.202 or equiv.)

This course offers a comprehensive review and reinforcement of the major aspects of German grammar and usage; continues to explore the four major skills of listening comprehension, speaking, reading, and writing; introduces the student to the reading of contemporary literary texts, including a full-length play—*Biedermann und die Brandstifter*, by the Swiss playwright Max Frisch.

33.204 Intermediate German II**4 Q.H.**

(Prereq. 33.203 or equiv.)

The course aims at helping students enlarge vocabulary and develop increased flexibility in the four basic language skills. Included are completion of grammar review, continued exposure to modern literary texts. One full-length play is read—*Der Besuch der alten Dame*, by the contemporary Swiss dramatist Friedrich Durrenmatt. Successful completion of this course entitles the student to choose from among the upper-level course offerings in the areas of German literature and/or composition and conversation.

33.207 Reading German**4 Q.H.**

This course is designed for those students who wish to develop their reading skills, without regard to other aspects of the language, such as speaking or writing. The grammar necessary for reading is stressed, together with vocabulary building; scientific and nonscientific texts are read. This course may provide assistance to students, graduate and undergraduate, who need to pass a reading examination to fulfill specific degree requirements.

33.227 German Composition and Conversation I**4 Q.H.**

(Prereq. 33.204 or equiv.)

This course strives to develop facility in speaking and writing German and stresses active use of the language. Students are provided an opportunity for practice in listening comprehension through German language films or tape-recorded interviews with native German speakers; expansion of vocabulary through guided group discussions on topics of general interest; and development of language skills in areas of individual interest through preparation of oral reports in German. Compositions are assigned on a weekly basis and grammar is reviewed as needed. Utilization of language laboratory. Recommended for students preparing for co-op in Germany.

33.228 German Composition and Conversation II**4 Q.H.**

(Prereq. 33.227 or equiv.)

Continuation of German 33.227 in content and format with emphasis on independent communication skills. Recommended for students preparing for co-op in Germany.

33.229 Advanced German Proficiency I**4 Q.H.**

(Prereq. 33.227 and 33.228, or permission of instructor)

The course offers intensive training in spoken and written German with the aim of providing students an opportunity to increase vocabulary and develop flexibility in the use of the language. Included are student-led discussions of German society and current affairs based on readings of current journals and periodicals; weekly written assignments; review and practice of grammar where necessary.

33.231 Masterpieces of German Literature I**4 Q.H.**

(Prereq. 33.204 or equiv.)

The course includes a survey of the major trends in the development of German literature from the *Hildebrandslied* to Martin Luther. In addition, reading of selected works of major authors of the twentieth century such as Hauptmann, Kafka, Mann, Brecht, Durrenmatt, and Boll. Choice of works to be read in a particular term will be based partially on theatre performances or film showings planned in the Boston area. Class attendance of these performances is

anticipated. Recommended as an introductory step to literature courses 33.245 and above. Offered every other year, alternating with 33.232.

33.232 Masterpieces of German Literature II**4 Q.H.**

(Prereq. 33.204 or equiv.)

This course includes a survey of the major trends in the development of German literature from Martin Luther to the present, including selected works of major authors of the nineteenth and twentieth centuries. Choice of works to be read in a particular term will be based partially on theatre performances or film showings planned in the Boston area. Class attendance of these performances is anticipated. Recommended as an introductory step to literature courses 33.245 and above. Offered every other year, alternating with 33.231. May be taken before 33.231.

33.235 Applied Linguistics**4 Q.H.**

The course explores the process of language learning and the nature of this experience for infants and adults. Emphasis is on the child's ability to master successfully the complex essentials of its first language by the age of five, and how the development of cognitive capacity and language-learning ability are related. The role of the parent and of the physical environment will also be discussed. Other topics include second-language learning, contrastive analysis, learning English as a second language or dialect, sign language, the significance of "errors," learning strategies, and a survey of language-teaching methods.

33.245 Classical Period of German Literature**4 Q.H.**

(Prereq. 33.232 or equiv.)

The course provides background and general survey of the period from 1750 to 1800, with particular emphasis on the works of Lessing and Schiller. Among the dramas read are Lessing's *Minna von Barnhelm* and *Nathan der Weise*, and Schiller's *Maria Stuart* and *Die Jungfrau von Orléans*. Lectures (in German) and reports.

33.246 The Works of Goethe**4 Q.H.**

(Prereq. 33.232 or equiv.)

The course includes drama, prose writing, and lyric poetry of Goethe: *Faust*, Part I; *Hermann und Dorothea*; *Egmont*; and *Iphigenie auf Tauris*. Lectures (in German) and reports.

33.247 German Literature of the Nineteenth Century**4 Q.H.**

(Prereq. 33.232 or equiv.)

The course offers background and general survey of German literature of the nineteenth century, with particular attention to prose and lyric poetry. The lyric poetry includes poems of all the important romantic poets, beginning with Holderlin, Tieck, Novalis, and extending through Morike. Among the prose works discussed are *Novellen* by Eichendorff, Tieck, Chamisso,

Kleist, Fougue, Keller, Meyer, and Ludwig. Lectures (in German) and reports.

33.248 German Drama of the Nineteenth Century 4 Q.H.
(Prereq. 33.232 or equiv.)

Dramas read are selected from Germany's foremost dramatists of the nineteenth century, including Kleist, Hebbel, Grillparzer, and Ludwig. Lectures (in German) and reports.

33.249 German Literature of the Twentieth Century 4 Q.H.
(Prereq. 33.232 or equiv.)

The course includes lyric poetry and prose works of important German writers of the twentieth century, including Schnitzler, Hauptmann, Mann, and Kafka. Lectures (in German) and reports.

33.250 German Drama of the Twentieth Century 4 Q.H.
(Prereq. 33.232 or equiv.)

Plays are selected from those by important dramatists of the twentieth century, including Schnitzler, Hauptmann, Sudermann, Hofmannsthal, Wedekind, Kaiser, Toller, and Brecht. Lectures (in German) and reports.

33.251 The German Lyric 4 Q.H.
(Prereq. 33.232 or equiv.)

The course offers a survey of the German lyric from the twelfth century to the present. Analysis and interpretation of representative selections from major lyric poets such as Walther von der Vogelweide, Gerhard, Fleming, Gryphius, Klopstock, Claudius, Goethe, Schiller, Holderlin, Eichendorff, Brentano, Heine, Morike, Storm, Meyer, Rilke, and Brecht. Background of the development of the German lyric, movements, and types. Class discussions and reports.

33.252 The Dramatic Works of Franz Grillparzer 4 Q.H.
(Prereq. 33.232 or equiv.)

The course includes reading, analysis, and interpretation of representative works of Franz Grillparzer, Austria's greatest dramatist: *Sappho*, *Des Meeres und der Liebe Wellen*, *Der Traum ein Leben*, *König Ottokars Glück und Ende*, and the novella, *Der arme Spielmann*. Collateral readings, discussions, and reports.

33.290, 33.291, 33.292, 33.293, 33.294 Directed Studies (each) 4 Q.H.

Directed Studies offer students a way of going beyond work given in the regular curriculum and may also serve as a means to complete major or minor requirements in certain situations. Directed Studies will not be given in areas adequately covered by existing courses. Priority is given to language majors and to juniors and seniors.

33.295, 33.296, 33.297, 33.298 Junior-Senior Honors Program (each) 4 Q.H.
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Chinese

34.101 Elementary Chinese I 4 Q.H.

This is a course in "Mandarin" Chinese designed to acquaint the student with features of the spoken and written language. Grammar, oral performance, and simple characters are stressed. For students who wish to speak another dialect of Chinese, consult instructor for proper placement.

34.102 Elementary Chinese II 4 Q.H.
(Prereq. 34.101)

This course is a continuation of 34.101. Grammar and spoken and written forms of the language are studied.

34.103 Intermediate Chinese I 4 Q.H.
(Prereq. 34.102)

This course is a continuation of 34.102. More advanced features of the language. Continued study of characters.

34.104 Intermediate Chinese II 4 Q.H.
(Prereq. 34.103)

This course is a continuation of 34.103. More advanced work in grammar, conversation, and characters.

Russian

Prerequisites listed for Modern Languages are based on current course numbers at North-eastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

34.201 Elementary Russian I 4 Q.H.

The course includes essentials of grammar, practice in pronunciation, progressive acquisition of a basic vocabulary, idiomatic expressions.

34.202 Elementary Russian II 4 Q.H.
(Prereq. 34.201)

Continuation of grammar study; oral and written exercises.

34.203 Intermediate Russian I 4 Q.H.
(Prereq. 34.202)

Designed to help further the student's knowledge of Russian through oral and written work; the study of grammar and reading texts of moderate difficulty.

34.204 Intermediate Russian II 4 Q.H.
(Prereq. 34.203)

Continuation of work and aims of 34.203.

34.207 Scientific Russian 4 Q.H.
(Prereq. 34.204 or equiv.)

The course offers readings of Russian texts in mathematics, physics, chemistry, astronomy,

biology, and medical science. Designed to help prepare the student for the department reading examination in his/her chosen field. As far as possible, texts are selected on the basis of the students' needs and interests.

34.215 Backgrounds in Russian Culture 4 Q.H.
Designed to offer the student a view of Russian culture and civilization, the course utilizes guest speakers, films, field trips, and discussions. Conducted in English.

34.217 The Works of Alexander Pushkin in Translation 4 Q.H.
This course offers a survey and analysis in English of Pushkin's artistic prose, lyric poetry, correspondence, friendships, and major literary influences.

34.218 Russian Literature in Translation 4 Q.H.
A companion to 34.217, this is a survey and analysis in English of some of the works of Tolstoi, Dostoevski, Chekhov, and others.

34.227 Russian Composition and Conversation I 4 Q.H.
(Prereq. 34.204 or equiv.)
Designed to assist students in developing skills in speaking and writing by means of detailed grammar review and extensive use of audio-visual media. Conducted in Russian.

34.228 Russian Composition and Conversation II 4 Q.H.
(Prereq. 34.227 or equiv.)
A continuation of 34.227 with an increased emphasis on speaking the colloquial Russian idiom. Conducted in Russian.

34.229 Advanced Russian Proficiency I 4 Q.H.
(Prereq. 34.228 or equiv.)
Emphasizes speaking and writing skills through the study of Russian word formation and derivation. Weekly compositions or oral reports are required. Conducted in Russian.

34.230 Advanced Russian Proficiency II 4 Q.H.
(Prereq. 34.229 or equiv.)
Emphasizes speaking and writing skills through the study and use of Russian idioms and colloquialisms. Conducted in Russian.

34.233 Stylistics and Advanced Grammar Analysis I 4 Q.H.
(Prereq. 34.204 or permission of instructor)
Designed for students pursuing a major or minor in the Russian language; focuses on modern usage of the Russian language through newspaper and magazine articles and short stories.

34.234 Stylistics and Advanced Grammar Analysis II 4 Q.H.
(Prereq. 34.233 or permission of instructor)
Continues goals of 34.233 and also focuses on helping students improve listening comprehension through the use of extensive laboratory work.

34.247 Russian Short Stories of the Nineteenth Century 4 Q.H.
(Prereq. 34.204 or equiv.)

The course offers detailed analysis of selected representative short stories read in Russian; study of the development of this genre.

34.251 Russian Expository Prose 4 Q.H.
(Prereq. 34.204)
Selected readings of lectures, speeches, essays, and critical studies by outstanding Russian scholars.

34.253 Russian Folklore 4 Q.H.
(Prereq. 34.204)
Various genres of Russian folk literature are read in Russian. Readings are supplemented with lectures and tape recordings.

34.254 Russian Poetry 4 Q.H.
(Prereq. 34.204)
The major works of important classical and modern poets are read in Russian and analyzed.

34.290, 34.291, 34.292, 34.293, 34.294 Directed Studies (each) 4 Q.H.
Directed Studies offer students a way of going beyond work given in the regular curriculum and may also serve as a means to complete major or minor requirements in certain situations. Directed Studies will not be given in areas adequately covered by existing courses. Priority is given to language majors and to juniors and seniors.

34.295, 34.296, 34.297, 34.298 Junior-Senior Honors Program (each) 4 Q.H.
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

Italian

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

35.201 Elementary Italian I 4 Q.H.
For the beginner who wants instruction in the essentials of Italian grammar and the opportunity to practice speaking and reading the language.

35.202 Elementary Italian II 4 Q.H.
(Prereq. 35.201 or equiv.)
Continued study of grammar and basic language skills. Practice in more advanced conversation and reading.

35.203 Intermediate Italian I 4 Q.H.
(Prereq. 35.202 or equiv.)
Review of grammar. Progressively more intensive practice in oral and written communication. Reading will be from selected modern texts.

35.204 Intermediate Italian II 4 Q.H.

(Prereq. 35.203 or equiv.)

Review of grammatical difficulties, with attention given to current idiomatic forms. Greater emphasis on self-expression. Reading of short stories or a modern novel.

35.217 The Works of Dante in**Translation I****4 Q.H.**

This course considers briefly the cultural background and various literary schools that influenced Dante. His life, his character, and minor works are discussed. The *Vita Nuova* and the first cantica of the *Divina Commedia*, the "Inferno," are read and analyzed in some detail. This course is intended for students of any background or major. Bilingual texts are used so that students with a background in Italian and others, may refer to the original for added interest and enrichment. Classes are conducted in English.

35.218 The Works of Dante in**Translation II****4 Q.H.**

This is a continuation of 35.217, but may be taken separately. The other two parts of the *Divina Commedia*, "Purgatorio" and "Paradiso," are studied in detail. The course is open to anyone. Bilingual texts used. Classes conducted in English.

35.227 Italian Composition and**Conversation I****4 Q.H.**

(Prereq. 35.204 or equiv.)

For students who have mastered the fundamentals of the language. There will be no study of grammar as such. The course aims at helping students strengthen speaking and writing ability through an analysis of the language, oral and written reports, and general discussions on a variety of topics. Conducted entirely in Italian.

35.228 Italian Composition and**Conversation II****4 Q.H.**

(Prereq. 35.227 or equiv.)

Continuation of 35.227, with stress on individual work, free discussions, and compositions. Conducted entirely in Italian.

35.231 Masterpieces of Italian Literature I 4 Q.H.

(Prereq. 35.204 or equiv.)

Introductory course in Italian literature covering the *Trecento* to the seventeenth century. An analysis will be made of major trends and writers beginning with the *doce stil nuovo*, Dante's *Vita Nuova*, and continuing with readings from Petrarca's *Canzoniere*, Boccaccio's *Decameron*, and Machiavelli's *La Mandragola*. Discussion of the readings, oral and written reports. Conducted basically in Italian, but students are allowed to express themselves in English.

35.232 Masterpieces of Italian**Literature II****4 Q.H.**

(Prereq. 35.204 or equiv.)

Continuation of 35.231, but may be taken separately. This course concentrates on authors

from the eighteenth to the twentieth centuries, such as Goldoni, Leopardi, Verga, Pirandello, Moravia, Levi, and Buzzati. A novel, a play, or poetry selections from each author will be discussed. Oral and written reports. Conducted basically in Italian, but students may use English.

35.249 Italian Literature of the Twentieth Century I**4 Q.H.**

(Prereq. 35.232 or equiv.)

Reading and discussion of some of the novels, plays, and poems from a variety of literary trends and styles that evolved between the turn of the century and World War II. Among the authors studied are Verga, Pascoli, D'Annunzio, Pirandello, Deledda, and Svevo. Oral and written reports. The course will be conducted basically in Italian, but students may use English. Offered in alternate years.

35.250 Italian Literature of the Twentieth Century II**4 Q.H.**

(Prereq. 35.232 or equiv.)

The postwar period to the present. Many important authors have arisen since the early forties, and their books reflect the preoccupations, moods, and aspirations of our changing times. Among the writers considered in this course are Moravia, Silone, Vittorini, Pavese, Guareschi, Buzzati, Sciascia, Ungaretti, Montale, and Quasimodo. Oral and written reports are required. English may be used, but the course will be conducted basically in Italian. Offered in alternate years.

35.280 Italian Seminar: Pirandello**4 Q.H.**

By viewing reality in man's world and man's personality with strikingly new insights, Pirandello contributed a new dimension to our understanding of human nature and brought about significant changes to the traditional conception of the theatre. This course examines the originality and art of Pirandello by a close study of some of his great plays and short stories. Class discussions, oral and written reports. Conducted in English. Offered in alternate years.

35.290, 35.291, 35.292, 35.293, 35.294 Directed**Studies****(each) 4 Q.H.**

Directed Studies offer students a way of going beyond work given in the regular curriculum and may also serve as a means to complete major or minor requirements in certain situations. Directed Studies will not be given in areas adequately covered by existing courses. Priority is given to language majors and to juniors and seniors.

35.295, 35.296, 35.297, 35.298 Junior-Senior Honors Program**(each) 4 Q.H.**

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 1.

American Sign Language

36.201 American Sign Language I 4 Q.H.

(Formerly 19.196)

An introduction to American Sign Language and deaf culture, this course focuses on frequently used signs, basic rules of grammar, nonmanual aspects of ASL, and some cultural features of the deaf community.

36.202 American Sign Language II 4 Q.H.

(Formerly 19.199)

(Prereq. 36.201 or permission of instructor)

A continuation of basic language and culture study, this course offers an opportunity to build receptive and expressive sign vocabulary. Study includes use of the signing space; further use of nonmanual components, including facial expression and body postures. Introduction to finger spelling.

36.203 Intermediate American Sign Language I

(Formerly 19.204)

4 Q.H.

(Prereq. 36.202 or permission of instructor)

This course emphasizes further development of receptive and expressive skills, finger spelling, vocabulary building, grammatical structures; encourages more creative use of expression, classifiers, body postures, and the signing space; introduces regional and ethnic sign variations and political and educational institutions of the Deaf Community.

36.204 Intermediate American Sign Language II

(Formerly 19.206)

4 Q.H.

(Prereq. 36.203 or permission of instructor)

The course consists of intensive practice involving expressive and receptive skills in story telling and dialogue; introduction to language forms used in ASL poetry and to the features of culture as they are displayed in art and the theatre.

36.205 Sign Language Interpreting I 4 Q.H.

(Formerly 19.205)

(Prereq. 36.204 or permission of instructor)

This is the first of a three-course sequence involving the theoretical and practical aspects of simultaneous interpretation of English into sign language and vice versa. Through lectures, discussions, and role playing, students are introduced to ethics, definitions, client-interpreter relationships, linguistic considerations, mechanics, and special considerations for various interpreting situations.

36.206 Sign Language Interpreting II 4 Q.H.

(Formerly 19.211)

(Prereq. 36.205 or consent of instructor)

Lectures, discussions, and role playing emphasize topics that include ethics, roles, fees, and Registry of Interpreters for the Deaf (R.I.D.) certification procedure. Laboratory work focuses on increasing skills in simultaneously interpreting English to sign language and vice versa.

36.207 Sign Language Interpreting III 4 Q.H.

(Formerly 19.212)

(Prereq. 36.206 or consent of instructor)

This course is designed for students who have completed the equivalent of Sign Language Interpreting I and II and wish to upgrade their skills. Laboratory work focuses on interpreting ASL into English and vice versa, and translating spoken English into manual English.

36.213 Methods and Materials in American

Sign Language Instruction

4 Q.H.

(Formerly 19.213)

(Prereq. 36.204, 36.132, 19.154)

This course offers a study of the theories of second-language learning and teaching as applied to ASL, and existing approaches to ASL instruction, with focus on materials, activity selection, utilization and selection of instructional media, and evaluation techniques.

36.215 Deaf Culture

4 Q.H.

(Formerly 19.132)

(Prereq. 36.201)

Course focuses on the status of deaf people as a linguistic and cultural minority group. Topics include the role of American Sign Language in the Deaf Community; educational and historical perspectives on deafness; and sociological and cultural make-up of the Deaf Community.

36.216 Deaf History

4 Q.H.

A survey of the history of deaf people in the Western world, with emphasis on the American Deaf Community, their language, education, and relationship to hearing society.

36.290, 36.291, 36.292, 36.293, 36.294 Directed

Studies

(each) 4 Q.H.

Directed Studies offer students an opportunity to go beyond course work of the regular curriculum or to pursue an individual learning project. May take the form of research, practicum, or language development activity.

Speech Communication

37.102 Effective Speaking

3 Q.H.

(Formerly 29.102)

(Prereq. Industrial engineering students only; speech communication for specific purposes)

Designed to help provide the student with a basic understanding of the communication process and its function as a means of relating to the world, ourselves, and other people, the course examines factors in intra- and interpersonal communication, group communication, and public speaking through lectures, discussions, structured learning experiences, and written assignments.

37.106 Speech Fundamentals

3 Q.H.

(Formerly 29.106)

(Prereq. Recreation majors only; speech communication for specific purposes)

This course is designed to give the student an

opportunity to develop a basic understanding of the communication process and its function as a means of relating to the world, ourselves, and other people. It examines factors in intra- and interpersonal communication, group communication, and public speaking through lectures, discussions, structured learning experiences, and written assignments.

37.109 Effective Speaking Workshop 2 Q.H.
(Formerly 29.113)

(Prereq. Civil engineering students only)

This course is designed to give the student an opportunity to acquire a basic understanding of the communication process and its function as a means of relating to the world, ourselves, and other people. It examines factors in intra- and interpersonal communication, group communication, and public speaking through lectures, discussions, structured learning experiences, and written assignments.

37.110 Voice and Articulation 4 Q.H.
(Formerly 29.110)

The course includes the study of voice technique: emphasis on pitch, projection, articulation, and vocal variety. A combination of theory and practical application.

37.111 Oral Interpretation 4 Q.H.
(Formerly 29.111)

The course focuses on application of basic vocal techniques to the dramatic reading of prose, poetry, and drama. Through literary analysis the author's meaning is understood and, by means of oral reading skills, communicated to an audience.

37.115 Introduction to Communication Skills 4 Q.H.
(Formerly 29.129)

This course is designed to give the student an opportunity to develop a basic understanding of the communication process and its function as a means of relating to the world, ourselves, and other people. It examines factors in intra- and interpersonal communication, group communication, and public speaking through lectures, discussions, structured learning experiences, and written assignments.

37.116 Business and Professional Speaking 4 Q.H.
(Formerly 29.108)

The course focuses on practice of oral presentations, group communication, conference and discussion techniques, interview methods, and occasion speaking. The course combines performance aspects with case study methods of communication on the professional level.

37.131 Introduction to Communication Theory 4 Q.H.
(Formerly 29.119)

This course is designed to offer basic knowledge and understanding of the processes involved in the transference of meanings. From the problems involved in defining communica-

tion, through a discussion of the nature of communication, various models of communication are examined. The nature of theory and requirements of adequate theory are discussed, leading to an examination of various theories of human communication, including psychological, sociological, information, and system theories.

37.132 Rhetorical Theory I 4 Q.H.
(Prereq. 37.115, 37.150)

This course examines various theories of rhetoric, starting with the early Greeks (Plato's "Phaedrus" and "Gorgias," Aristotle's "The Rhetoric"), progressing through the rhetoric of Rome (Cicero's "de Brute" and Quintilian's "de Institutione"), and moving into a brief synopsis of Medieval rhetoricians (Peter Ramus, Thomas Wilson, Thomas de Quincey, Francis Bacon, George Campbell, Richard Whately). The focus will be the student's growing knowledge and appreciation of the history and principles of rhetoric, which is the foundation of oral discourse.

37.150 Introduction to Mass Communication 4 Q.H.
(Formerly 29.127)

This is an introductory course designed to explore the many media through which people express themselves: radio, television, film, print, music. Attention is paid to the role of the individual as a media consumer.

37.151 Organizational Communication 4 Q.H.
(Prereq. 37.150)

Organizational Communication examines the nature of communication in the context of complex organizations. The student will explore both internal and external organizational communication. Analysis of organizational communication will include: (a) communication networks, (b) communication technologies, (c) interpersonal communication modes, and (d) organizational interdependencies and their effect on information transfer and diffusion. The course will include a section on organizational communication assessment and communication program implementation.

37.212 Advanced Vocal Techniques 4 Q.H.
(Formerly 29.112)

(Prereq. 37.110 or permission of instructor)

Development and application of vocal techniques acquired in 37.110. Emphasis on vocal analysis, flexibility, and regional patterns of speech.

37.214 Advanced Oral Interpretation 4 Q.H.
(Formerly 29.114)

(Prereq. 37.111)

Opportunity to develop further oral reading skills acquired in 37.111. In addition, the course includes work with accents and dialects, study of reader's theatre, and an investigation of classical and modern philosophies of the art.

37.230 Interpersonal Communication I 4 Q.H.
(Formerly 29.141)

This is a conceptual, theoretical course designed to help increase awareness of the communication process. The course provides an examination of the ways in which we relate to other individuals and factors that influence these processes.

37.231 Interpersonal Communication II 4 Q.H.
(Formerly 29.142)

(Prereq. 37.230 or permission of instructor)

The course focuses on application of concepts developed in Interpersonal Communication I. It is an experiential course, exploring ways of becoming more aware of one's self and one's relationships with others and offering an examination of various options for communicating and increasing knowledge of the group process. Enrollment limited.

37.232 Female/Male Communication 4 Q.H.
(Formerly 29.143)

The course surveys the various dimensions of female-male relations as they are created, sustained, or disintegrated through communication transactions. Emphasis will be on the various images and stereotypes of male and female sexual identity as they affect and are affected by communication in the development of hostility, friendship, or intimacy. Temporary, permanent, and destructive female-male relations will be examined as they lead to alternate life styles.

37.233 Rhetorical Criticism 4 Q.H.
(Prereq. 37.132)

This course focuses on the principles of rhetorical analysis: theories, methods, and the application of these to discourses. Various types of discourse will be studied throughout the quarter. Attention will be given to understanding various methods and problems in rhetorical analysis. Judgment criteria, as well as the role of rhetorical criticism in society, will be examined.

37.236 Theories of Persuasion 4 Q.H.
(Formerly 29.115)

The course surveys theoretical and conceptual approaches and research pertaining to the effectiveness of communication that is intended deliberately to induce changes in attitudes, beliefs, values, and/or behavior.

37.237 Persuasive Techniques 4 Q.H.
(Formerly 29.116)

(Prereq. 37.236 or permission of instructor)

The course offers a critical, in-depth analysis of instances of persuasion as they occur in social interaction, social movements, politics, and advertising; identification of practical strategies employed; and the factors that influence the effectiveness of those strategies when persuaders attempt to influence others.

37.238 Group Discussion 4 Q.H.
(Formerly 29.117)

Working in task groups, students are expected to explore theory and research in the area of group dynamics and to apply their knowledge to the classroom experience as they work on developing skills in decision making, problem solving, membership, and leadership.

37.239 Argumentation and Debate 4 Q.H.
(Formerly 29.105)

An applied course designed to help develop skills in rational decision making through advocacy. Attention is given to logical reasoning, psychological methods, and motivational techniques.

37.240 Contemporary Public Address 4 Q.H.
(Formerly 29.126)

The course offers a critical study of the public address of leading contemporary speakers representative of important political and social movements. This course seeks to help the student gain an appreciation of the dimensions and varieties of contemporary public address, broadly defined as symbolic discourse. From an understanding of various theories and approaches to public address, rhetorical situations are examined; the use of agitative and control strategies to accomplish social change is critically evaluated.

37.241 Theories of Audience Behavior 4 Q.H.
(Formerly 29.133)

Surveying theoretical models, concepts, and research, the course focuses on the role of the receiver as an active participant in the communication process. Topics include individual information processing; listening as a learned behavior; intra-audience effects; relations between media and audience characteristics; dissemination, rumors, and information; and the development of societal norms and mores.

37.244 Negotiation Skills 4 Q.H.
(Prereq. Middler standing or higher, or permission of instructor)

The skills involved in bringing matters to mutually acceptable settlements will be investigated and applied through lectures, discussions, and especially through performance in case studies and role-playing simulations. Classroom activities will include such personal, professional, and governmental processes as conflict resolution, problem solving, and advocacy. Particular emphasis will be placed on the collective bargaining process in the private and public sectors, including negotiation, mediation, and arbitration.

37.250 Broadcast Production 4 Q.H.
(Formerly 29.144)

(Prereq. 37.150 or permission of instructor)

The course introduces the student to the equipment of a broadcast studio, surveys

broadcast production techniques, and provides opportunities in class for applied practice through the production of programming suitable for broadcast.

37.252 Producing and Directing for Radio

(Prereq. Permission of instructor) **4 Q.H.**

The course centers around the role of the producer/director in the creation, pre-production planning, and execution of local and network radio programs. Emphasis is on live broadcasts and live assembly of partially pre-recorded programs. A great deal of time will be spent on the written materials necessary for program planning. The class will spend some time in the studio working on model program production and, possibly, actual live music performance broadcasts.

37.254 Special Topics in Broadcasting **4 Q.H.**
(Formerly 29.145)

(Prereq. 37.150 or permission of instructor)

This course introduces the student to the variety of roles played by broadcast professionals and to the interplay of professional functions integral to the broadcast industry. The focus is on a different aspect of the broadcast industry each term.

37.270 Consultation Skills **4 Q.H.**
(Formerly 29.140)

(Prereq. 37.131, 37.115, 37.230, and 37.238)

The course gives students the opportunity to acquire the skills necessary for analyzing communication difficulties in industry, organizations, and groups. The course includes theory, discussion, practice, and feedback, using a case study method.

37.271 Introduction to Communication Research
(Formerly 29.281) **4 Q.H.**

(Prereq. 37.131 or permission of instructor)

The course provides an introduction to scientific method and epistemology as it applies to the investigation of communication phenomena. The course is structured to assist students in finding and critically evaluating literature dealing with factors that influence the effectiveness of communication and that may be pertinent to either academic projects or managerial decision making.

37.285 Special Topics in Speech Communication
(Prereq. Permission of instructor) **4 Q.H.**

The course provides an in-depth examination of a subject of particular significance to the field.

37.290; 37.291 Directed Study (each) **4 Q.H.**

37.295 Internship in Speech Communication

4 Q.H.

This course provides a student with the opportunity to gain academic credit for on-the-job training in an allied career field. Enrollment requires prior approval by a department committee, demonstration that the job allows opportunities to apply theoretical understanding to specific application in the work environment, and faculty advisement as well as on-the-job supervision.

93.130 Professional Practices:

Individual and Social Dimensions

4 Q.H.

The course explores the dimensions and dilemmas of freedom and responsibility confronting professional people practicing within limits set by socio-economic conditions, by clients, and by other professionals. Case histories are examined to illustrate the dilemmas professionals face, the choices that are typically made, and the consequences these have on the freedom of the practitioner and on personal and professional integrity.

93.131 Introduction to Women Studies:

Image, Myth, and Reality

4 Q.H.

This introductory course in the study of women in society encompasses the historical, political, economic, and social processes that have created both the image and the reality of women in contemporary society. An overview of the many different disciplinary approaches to the study of women.

93.175 Individual in Society

4 Q.H.

This team-taught course, offered jointly by the departments of Philosophy and Religion, Speech Communication, and Sociology, explores the dimensions and dilemmas of freedom and responsibility. The ways in which the self emerges and adapts itself in socially oriented communication processes (including verbal and nonverbal symbolic language) are discussed, especially as these relations exercise constraints on enlightened choice for both individuals and institutions.

93.176 Communication and Quality of Life

4 Q.H.

This course offers students an opportunity to develop a meaning of the concept "quality of life" and to gain knowledge of subjective and objective methods for measuring and assessing that concept. Problems in professions that influence quality of life are then identified, explored, and analyzed, and possible solutions evaluated.

Journalism

38.100 Interpreting the Day's News 4 Q.H.

Study of the news of the day and the function of the newspaper, news magazine, and news broadcasts in American life. Topics include rights and responsibilities of the press and how news is gathered, processed, and disseminated by the various media. For non-majors as well as majors.

38.101 History of Journalism 4 Q.H.

Development of American journalism from its European and English beginnings. Topics include: the colonial press, the great personal journalists of the nineteenth century, and the impact of major technological changes in mass communications media in the twentieth century. Some writing required.

38.102 Journalism Ethics and Issues 4 Q.H. (Prereq. 38.101)

Responsibilities of news media; ethical problems confronting decision makers in various journalistic fields; the principles found in codes of the American Society of Newspaper Editors, the Associated Press Managing Editors, the Society of Professional Journalists, and other organizations. Some writing required.

38.103 Newswriting I 4 Q.H. (Prereq. 30.103)

Functions of the editorial department and procedures in obtaining and writing news stories. Extensive news writing. Introduction to interviewing. Legal issues defined.

38.104 Newswriting II 4 Q.H. (Prereq. 38.103)

Practice in multi-source and breaking stories. Introduction to government and court reporting. Advanced work in interviewing, and writing under deadline pressure. Discussion of legal issues.

38.105 Techniques of Journalism 4 Q.H. (Prereq. 38.104)

Writing in-depth and multiple-source stories requiring significant research. Introduction to investigative reporting. Feature writing. Review of legal issues.

38.106 Editing 4 Q.H. (Prereq. 38.104)

Practice in copy editing and headline writing. Assignments in photo selection, cropping and cut-line writing. Introduction to page layout.

38.107 Law of the Press I 4 Q.H. (Prereq. 38.106)

The meaning of freedom of the press, explored through study and discussion of the evolving First-Amendment interpretations of the United States Supreme Court.

38.108 Law of the Press II 4 Q.H. (Prereq. 38.107)

Legal problems of libel, slander, and invasion of privacy; the balance between private rights and the public's "need to know."

38.112 Magazine Writing 4 Q.H. (Prereq. 38.104)

Writing and free-lancing magazine articles; analyzing magazines as markets; selecting the best feature format—how-to-do-it, profile, personal experience, human interest, interpretive pieces, and others.

38.120 Radio News Gathering and Reporting 4 Q.H. (Prereq. 38.103)

Writing and editing news for radio, with practice in interviewing, organizing news scripts, and integrating audio materials into broadcast.

38.121 Television Newswriting 4 Q.H. (Prereq. 38.103)

Writing for television news as opposed to writing for other news media; importance of the writer-reporter as field-producer and writer-producer; terms and language used in the production of TV news shows. Actual individual production of news shows; field trips to TV stations; guest lecturers from the TV news media.

38.122 Television News Production 4 Q.H. (Prereq. 38.103 and 38.121, or permission of instructor)

Techniques used by the electronic journalist and TV news producer. Students will have the opportunity to build a TV news show. Reporting with portable TV cameras and editing equipment.

38.130 Advanced Reporting 4 Q.H. (Prereq. 38.105)

Advanced investigative and team reporting. Series stories and research; precision reporting.

38.132 Local Government Reporting 4 Q.H. (Prereq. 38.104)

Coverage of town/city government, with emphasis on the "beat" approach to reporting public affairs. Practical, in-the-field experience is emphasized in such projects as town meetings, meetings of boards of selectmen, and other commissions and bodies transacting public business.

38.135 Journalism and the Mass Media 4 Q.H.

Seminars featuring well-known professionals from major newspapers, radio-TV stations, wire services, magazines, photography, and public relations. An up-to-date, in-depth exploration of techniques and theories used in various media.

38.136 Public Relations Principles 4 Q.H. (Prereq. Junior standing)

Principles, history, and methods of public relations; processes of influencing public opinion; responsibilities of the public relations practitioner; analyses of public relations programs.

38.140 Design and Graphics 4 Q.H. (Prereq. 38.106)

Layout and design principles applied to newspapers, magazines and other print media. Type

faces, copy measuring, dummyming, photo sizing, keeping copy flow charts. Application of design and graphics principles to advertising layout.

38.150 Advertising Principles 4 Q.H.

Development, procedures, economic functions, and responsibilities of advertising: planning, research, production, and other elements that go into successful advertising.

38.151 Advertising Copy Writing 4 Q.H.
(Prereq. 38.103, 38.150)

Theory and techniques of creating advertising copy for newspapers, magazines, radio, television, and direct mail. Fact gathering, copy structure, and advertising design are emphasized.

38.152 Advertising Practice 4 Q.H.
(Prereq. 38.151)

Preparation of advertising for print and broadcast media, including campaign planning and space and time buying and scheduling. Product research, consumer surveys, and measuring the effects of advertising.

38.160 Public Relations Problems 4 Q.H.
(Prereq. 38.136)

Application of public relations techniques to problems; case studies in industry, labor, education, government, social welfare, and trade associations.

38.161 Public Relations Practice 4 Q.H.
(Prereq. 38.103 and 38.136)

Practices and techniques employed in the field, including organization of events and functions.

Campaign planning, research, and media relationships are studied.

38.170 Seminar 4 Q.H.
(Prereq. Upperclass standing)

Discussions and readings on topics of current significance in various journalistic fields.

38.175 Publication Production and Management 4 Q.H.
(Prereq. 38.106)

Examination of the organizational structure, production methods, and management procedures of print media companies. Interaction of business, advertising, production, and circulation departments.

38.201 Basic Photojournalism 4 Q.H.
(Prereq. 38.103)

Camera and darkroom procedures will be covered along with cropping, assignment techniques, theory, and photo caption methods.

38.290 Honors in Journalism 4 Q.H.

38.291 Directed Study in Journalism 4 Q.H.

38.295 Honors in Journalism 4 Q.H.

(Prereq. Juniors and seniors only)

38.296 Honors in Journalism 4 Q.H.

(Prereq. Juniors and seniors only)

38.297 Honors in Journalism 4 Q.H.

38.298 Honors in Journalism 4 Q.H.

(Prereq. Juniors and seniors only)

Economics

Unless otherwise stated there are no prerequisites for advanced economics courses. Exceptions are made at the discretion of the instructor.

39.105 Principles of Economics 4 Q.H.

Topics include development of macroeconomic analysis; review of national income concepts; national income determination, fluctuation, and growth; role of the banking system and the Federal Reserve System; government expenditures and taxation; international trade; balance of international payments.

39.106 Principles of Economics 4 Q.H.

The course focuses on the role of the market pricing system of demand and supply in determining the allocation of resources to competing uses, and why this system may not function adequately in certain areas. Study includes the application of economic principles to private and public problems in such areas as pollution, poverty, and racial discrimination.

39.115 Principles and Problems of Economics I 4 Q.H.

The course offers an introduction to the conceptual aspects of economics; the flow of national income; economic growth and fluctuation;

the role of money and banking; monetary and fiscal policies. Emphasis is on assisting students in developing conceptual tools for use in the analysis of economic problems facing modern society.

39.116 Principles and Problems of Economics II 4 Q.H.

The course focuses on development of basic theory of demand, supply, and market price. Applications to selected microeconomic problems such as basic economics of monopoly and competition, poverty, race and discrimination, urban affairs, pollution, and other problems that relate to the role of the pricing system in resource allocation and income distribution.

39.130 Medical Economics 4 Q.H.

The course includes examination and discussion of the following topics: health-care trends in the United States; causes for increases in medical-care costs; supply and training of health-care personnel; the nation's need for physicians, nurses, pharmacists, and other allied health personnel; the quality of medical

care; economics of health insurance plans; consumer demand for health care; medical facilities; professional and semiprofessional personnel.

39.140 Economics of Crime 4 Q.H.

The course offers theoretical and empirical analysis of the economic causes of criminal behavior. The social costs of crime and its prevention will be covered; techniques for designing optimum law enforcement policies will be developed.

39.150 Economics of World Energy and Primary Resources 4 Q.H.

This course investigates economic, political, and historical backgrounds of the energy and other resources problems. Future impact of primary resources limitations on United States and world economics are analyzed. Feasibility studies of resource substitution.

39.155 Superpower Economics 4 Q.H.

This course offers an analysis of the relative economic structure and strength of the United States, the Soviet Union, Japan, the Common Market, and China, as well as the economic relations among these powers. The course also examines the impact of these relations on the domestic economies of the superpowers and of the developing nations of the world.

39.170 Economic Issues in Minority Communities 4 Q.H.

Minority lifestyles, perspectives, self-images and social position in the urban community are all affected by economic factors, especially those specific to the minority poor. Students have the opportunity to examine these issues, particularly in terms of the applications of basic economic theories to the economic realities of minority communities.

39.190, 39.191 Directed Study (each) 4 Q.H.

This course offers independent work under the direction of a member of the Department on a chosen topic. Limited to qualified seniors majoring in economics, with approval of Department.

39.241 Local Labor Market Analysis and Human Resource Planning 4 Q.H.

(Prereq. 39.115 and 39.116, or 39.105 and 39.106; 39.275 strongly recommended)

This course helps acquaint the student with a variety of methods and data sources for analyzing conditions in regional, state, and local labor markets to determine the extent, nature, and causes of human resource problems and to utilize that information in planning and designing appropriate employment and training strategies. Topics will include empirical analysis of state and local labor force developments, unemployment and poverty problems, the industrial and occupational composition of employment, wage structures, and trends in state and local income distributions, as well as

methods for planning employment and training programs at the state and local levels.

39.242 Economics of Education and Human Capital 4 Q.H.

(Prereq. 39.115 and 39.116, or 39.105 and 39.106; 39.279 strongly recommended)

This course provides a theoretical and empirical treatment of a variety of economic issues related to education and job training programs, including formal education (secondary and post-secondary), vocational education, on-the-job training, and CETA-related employment and training programs. Emphasis will be placed upon the use of analytical techniques for determining the effectiveness of education and training investments from a private and social standpoint, including the design of follow-up studies, cost-effectiveness analysis, and benefit-cost analysis.

39.250 Statistics I 4 Q.H.

Topics include elementary set theory, basic probability, measurement and presentation of economic statistics, descriptive statistics, basic estimation techniques, testing statistical hypotheses and sampling problems.

39.251 Statistics II 4 Q.H.

(Prereq. 39.250)

Topics include analysis of variance, correlation and linear regression analysis, multivariate regression analysis, and Bayesian decision making.

39.253 Accounting Data for Social Scientists 4 Q.H.

(Prereq. 39.115 and 39.116, or 39.105 and 39.106, or permission of instructor)

This course is designed to familiarize non-accountants with the basic techniques and procedures of private and public accounting. Topics include developing and interpreting income statements and balance sheets, asset turnover, key accounting ratios, capital budgeting, cost flow analysis, and present-value determinations. The course also compares and contrasts the treatment of macro- and micro-accounting data.

39.254 Managerial Economics 4 Q.H.

(Prereq. 39.116 or 39.106)

This course emphasizes the application of economic principles and theory, by the use of case studies, to the solution of decision making problems in such areas as demand forecasting, price policies, estimation and control of costs, financing of capital investments, and responses to government taxation and regulation policies.

39.255 Microeconomic Theory 4 Q.H.

(Prereq. 39.106, 39.116, or equiv.)

A detailed study of supply-and-demand analysis, various elasticity concepts and applications, theory of consumer demand, theory of production, derivation of cost curves. Detailed analyses of pricing and output behavior in the several

market structures with their welfare implications; the pricing of resources.

39.256 Macroeconomic Theory 4 Q.H.
(Prereq. 39.105, 39.115, or equiv.)

Investigation of the conceptual and empirical problems of creating and using national accounts; price index problems; conceptual and empirical evaluation of several consumption and investment functions and their policy implications; multiplier and accelerator models; a brief history of recent cyclical fluctuations. Theories of inflation and growth are analyzed in the light of recent economic history.

39.259 European Economic Development 4 Q.H.
Economic inheritance of the nineteenth-century development of capitalism and laissez-faire. The aftermath of the Industrial Revolution, European overseas expansion, the twentieth century, the world wars, the dissolution of empires, American economic conquest and European integration, the future of less developed areas in southern Europe. Environmental impact of industrialism and the implications of technological society.

39.260 American Economic Development 4 Q.H.
Economic development of the United States from the colonial period to the present, historical changes in available factors, economic institutions and technologies, special attention to preconditions of industrialism. The American Industrial Revolution, its spread and socio-economic consequences. The Great Depression and the subsequent rise of mixed economy and welfare state; U.S. adjustments to postwar economic changes.

39.261 Economic History of Less Developed Countries 4 Q.H.
The problems of initiating and sustaining economic growth and development in selected Third World countries during the last two hundred years. Role of traditional economic structures of different development strategies and state policies.

39.262 Government Expenditures: Structure and Evaluation 4 Q.H.
(Prereq. 39.106, 39.116, or equiv.)
Fiscal functions of government, fiscal institutions and politics, theory of social goods, public expenditure growth and structure, the federal budget expenditure evaluation and cost-benefit case studies, fiscal federalism in theory and practice.

39.263 Financing of Government: Taxation and Debt 4 Q.H.
(Prereq. 39.106, 39.116, or equiv.)
Principles of taxation; problems of tax structure and reform; major names at federal, state, and local levels; tax burden incidence; effects of taxation on economic efficiency and growth; negative income tax and social security finance;

issues of public debt; public enterprise pricing; international tax coordination; taxation in developing countries.

39.265 Money and Banking 4 Q.H.
(Prereq. 39.105, 39.115, or equiv.)

A study of the nature and the functions of money, credit, and the role of financial organizations in the U.S. economy. The basic theories of banking, the money supply, monetary theory, and monetary policy will be emphasized.

39.267 Economics of Transportation 4 Q.H.
Transportation and land-use patterns; externalities; social costs and social benefits of various modes of transportation, ownership, regulations, and financing of various modes of transportation; economies of new technology in transportation.

39.268 Urban Economics 4 Q.H.
Study of urban growth and development, inter-metropolitan location of business firms, regional shifts in economic activity, intra-metropolitan location of firms and households, and land use patterns.

39.269 Urban Economic Problems and Policies 4 Q.H.
Sequel to 39.268, Urban Economics. Economic analysis of selected urban problems such as housing, poverty, transportation, education, health, crime, and the urban environment. Discussion of public policies relating to such problems.

39.271 Social Control of Economic Activities 4 Q.H.
Development of the government's role in economic activities, examining the relation between the government and industry, labor, agriculture, public utilities, and consumers. The course will trace the changing role of the government from a laissez-faire policy to one of direct intervention in the economy. Current topics such as wage and price control, environment and antipollution policies, consumer protection, and conglomerate mergers will be discussed.

39.273 Industrial Organization and Public Policy 4 Q.H.
(Prereq. 39.255)
The theoretical framework for analysis and evaluation of the static and dynamic performance of real markets. An examination of the empirical studies testing the usefulness of applying theory to real markets. An examination of antitrust as a public policy designed to promote better market performances.

39.275 Labor Economics 4 Q.H.
Economic analysis of the labor market, including the labor force, the demand for labor, and the institutions and policies dealing with them. An examination of employment, unemployment, wage determination, and the development and efficient use of labor resources; collective bargaining issues and their economic consequences.

39.277 Economics of the Quality of Urban Environment and Control**4 Q.H.**

Economic analysis of air, water, thermal, and noise pollution; the utilization of urban space and other urban resources; identification of possible economic effects of urban environment, such as crime, delinquency, immobility, and congestion.

39.278 Income Inequalities and Discrimination**4 Q.H.**

Economic analysis of income inequalities and incidence of poverty. Examination of forces contributing to income inequality and poverty; economics of racial discrimination; public welfare system and other income maintenance schemes.

39.279 Employment and Training Programs and Policies**4 Q.H.**

Objectives of employment and training programs; efforts to improve the labor market position of impoverished groups; economic evaluation of employment and training programs; planning for local labor markets and future needs.

39.280 Comparative Economics**4 Q.H.**

Competing types of theoretical economic systems; analysis of organization and operation of currently existing types of communist, socialist, and capitalist economies; comparison and evaluation of economic behavior and performance of different economic systems.

39.281 Introduction to Mathematical Economics

(Prereq. 39.115 or 39.105; 39.116 or 39.106; 10.105)

4 Q.H.

Functional analysis, matrix algebra, differential calculus and optimization—mathematics and elementary economic applications.

39.282 Mathematical Economics**4 Q.H.**

(Prereq. 39.281 or permission of instructor)

For economics, mathematics, business, and engineering students interested in a broad coverage of economic analysis using mathematical techniques as tools. Topics include models of the firm, demand theory, input-output, and other planning and policy models of the national economy.

39.283 Women in the Labor Market**4 Q.H.**

Economic analysis of the labor market position of women in light of the changing structure of the economy of the United States and of the institutional setting. Analysis of female labor participation, unemployment, wage differentials, occupational concentration, and occupational segregation. Theories and evidence of sex discrimination. New opportunities open to women.

39.285 Development Economics**4 Q.H.**

Prospects for economic growth and development in poor nations as indicated by economic analysis and historical experience: social, cultural, and institutional determinants of growth; analysis of agriculture and development,

the role of technological change, population; and foreign trade.

39.286 International Economics**4 Q.H.**

(Prereq. 39.115, 39.116 or equiv.)

Introduction to the theory of international trade and payments; analysis of tariffs and commercial policy; the international monetary system; trade and payment issues in developed and less-developed countries.

39.288 Business Cycles and Inflation**4 Q.H.**

(Prereq. 39.105 or 39.115; 39.106 or 39.116; 39.256)

A study of the theories of business cycles and inflation and an empirical application of these theories to current business cycle, inflation, and stagflation problems.

39.289 Advanced Economic Theory**4 Q.H.**

(Prereq. 39.255 and 39.256)

The course provides advanced theoretical treatment of selected topics in micro- and macroeconomics. Recommended for students planning to take graduate economics.

39.291 Senior Economic Seminar**4 Q.H.**

(Prereq. 39.255 and 39.256)

This is a course for senior economics majors, coordinating and applying economic concepts, methodology, and data to contemporary issues and problems of broad social, economic, and philosophical importance.

39.292 History of Economic Thought**4 Q.H.**

This course provides comprehensive study in the development of economic thought. Coverage includes mercantilism as the first economic doctrine; analysis of older classical school, its later refinements (modern marginalism), and its important critics (socialists, Marxists); Keynesian and modern developments.

39.293 Introduction to Econometrics**4 Q.H.**

(Prereq. 39.105 or 39.115; 39.106 or 39.116; and 39.251)

The course focuses on the methods of econometric estimation and forecasting. Coverage includes topics in various statistical techniques. Students are given the opportunity to construct their own models and use computer facilities for estimation and forecasting.

39.294 Problems in Economic Research**4 Q.H.**

(Prereq. 39.105 or 39.115; 39.106 or 39.116; 39.251)

This course examines research methods of practicing economists with typical problems from applied areas of economics and choice of modeling framework; problems of data collection, review of estimation techniques and interpretation of results; development of static and dynamic adaptive policy models.

39.295, 39.296, 39.297, 39.298 Junior-Senior Honors Program**(each) 4 Q.H.**

For prerequisites and other details, see the section for the Junior-Senior Honors Program on page 1.

Accounting

41.111 Accounting Principles I

4 Q.H.

This first of a series of accounting courses assumes students do not possess knowledge of the subject. Both this course and 41.112 are designed to help provide an understanding of accounting issues and objectives for proper interpretation and analysis of financial data. Specific topics covered in this first course are: 1) the nature, function, and environment of accounting; 2) the basic accounting model; 3) financial and analytical ratios; 4) the accounting cycle; 5) accounting for merchandising entities; and 6) the control of cash and receivables.

41.112 Accounting Principles II

4 Q.H.

(Prereq. 41.111)

The second of a series of accounting courses. Students are introduced to financial and managerial accounting decisions through class discussions, short exercises, and demonstration problems. Specific topics covered include: 1) control of inventory; 2) acquisition, depreciation, and disposal of plant and equipment; 3) paid-in capital related to sole proprietorships, partnerships, and corporations; 4) short- and long-term debt financing; 5) the analysis and interpretation of financial reporting; and 6) the statement of changes in financial position.

41.118 Principles of Accounting

8 Q.H.

This course covers the content of courses 41.111 and 41.112 and is primarily intended for transfer students.

41.205 Cost Accounting for Management

4 Q.H.

(Prereq. 41.112)

This course offers an examination of cost accounting from a managerial viewpoint. The impact of quantitative and behavioral aspects on budgets and cost control is stressed. This course is designed specifically for management majors.

41.210 Introduction to Accounting—

A. & S.

4 Q.H.

(Not open to College of Business Administration students)

Specifically for arts and sciences majors, this course is designed to help provide a fundamental knowledge of accounting to students who do not expect to become accountants but would like the opportunity to learn to understand, interpret, and make use of accounting data. The course surveys the foundations of accounting and the role it plays in the management of the profit and nonprofit sectors of the American economy.

41.251 Intermediate Accounting I

4 Q.H.

(Prereq. 41.112 or equiv.)

The principal foundation course for accountants begins with a comprehensive review of basic ac-

counting principles, operations, and financial statements. Development of accounting theory is stressed in the analysis of alternative treatments and procedures. Specific areas receiving intensive treatment are cash, accounts receivable, inventories, and current liabilities.

41.252 Intermediate Accounting II

4 Q.H.

(Prereq. 41.251)

This course is a continuation of the study of accounting principles, concepts, and procedures. Specific topics emphasized are long-term assets, depreciation, stockholders equity, and EPS.

41.253 Cost Accounting I

4 Q.H.

(Prereq. 41.112)

This course examines cost determination and use. Special consideration is given to manufacturing concerns. Specific coverage includes cost behavior, relevant costs, performance evaluation, budgets, and standard costs.

41.254 Cost Accounting II

4 Q.H.

(Prereq. 41.253)

This course is a continuation of 41.253 (Cost Accounting I) and gives special attention to the use of cost data in decision making, budget planning, and the control process.

41.255 Intermediate Accounting III

4 Q.H.

(Prereq. 41.252)

This course completes the study of basic accounting concepts and covers special areas of concern to modern accounting practice. Leases, pensions, accounting changes, income tax accounting, changes in financial position, price-level and current-value accounting are studied.

41.257 Auditing

4 Q.H.

(Prereq. 41.255)

Designed for the student who plans to enter the public accounting profession, this course examines audit concepts, standards, and procedures, including the auditor's legal and ethical responsibilities. Emphasis is on concepts rather than procedures. Specific areas covered are auditing standards, auditor's reports, internal control, statistical sampling, EDP, and legal liability.

41.260 Federal Income Taxes I

4 Q.H.

(Prereq. 41.255 or 41.112)

This course stresses basic understanding of the federal income tax structure relating to individuals rather than to corporations. Students are required to complete several research cases directed at solving various tax problems. Case studies introduce the student to the current Internal Revenue Code, income tax regulations, and cumulative bulletins. Tax court cases and various private company publications are discussed.

41.262 Accounting Theory and Practice 4 Q.H.
(Prereq. 41.255)

Objectives are to examine: 1) the theory and practice of corporate financial reporting and some of the controversial areas in accounting; 2) the pronouncements and research studies of the authoritative institutions of the profession relating to the practice of accounting; 3) the textual and periodical literature on accounting theory.

41.263 Accounting Planning and Control 4 Q.H.
(Prereq. 41.254)

This course provides an examination of the role of management planning and control systems and problems inherent in their design and use, and defines the process of identifying factors in the design of these systems.

41.264 Advanced Accounting Problems 4 Q.H.
(Prereq. 41.255)

This course is an in-depth analysis of various accounting topics for the student planning a career as a professional accountant. Topics covered are government and not-for-profit accounting; partnerships; installment sales; consignments; segment and interim reporting; foreign currency accounting; troubled-debt restructurings; and liquidations, estates, and trusts.

41.265 Management Accounting 4 Q.H.
(Prereq. 41.263)

This course examines the role of the management accountant. Topics include relation between financial and managerial accounting, design and use of accounting and control systems, measurement techniques and uses, the role of behavior in accounting, performance evaluation, and other topics of current interest.

41.269 Advanced Accounting Problems II 4 Q.H.
(Prereq. 41.255 or permission of instructor)

This course is a comprehensive analysis of the accounting theory and practice associated with corporate acquisitions and combinations. Topics include methods of consolidation-elimination of profits on intercompany transactions, purchase versus pooling of interests, and

accounting for good will. The course is intended for the serious student preparing for a career as a professional accountant.

41.272 Internal Auditing 4 Q.H.
(Prereq. Middler standing)

This course is designed to aid students in understanding how the internal auditor undertakes a review and appraisal of operations. Study will focus on the internal audit environment, preparation of long-range programs, the performance of preliminary surveys, flowcharting, the development of audit programs, sampling, audit techniques, and reporting. The course is case-study oriented.

41.273 Federal Income Taxes II 4 Q.H.
(Prereq. 41.260)

This course is a continuation of 41.260 (Federal Income Taxes I), focusing on taxpayers other than individuals and the treatment of those property transfers subject to federal, gift, estate, and trust taxes. Tax research is an important element of this course. A major emphasis is given to tax planning considerations, especially to gift and death tax consequences.

41.274 Accounting Systems 4 Q.H.
(Prereq. Middler standing)

This course examines the process of designing both financial and managerial accounting systems. The approach is conceptual, and the course considers the use of computer technology in designing new systems where computers are appropriate. The course assumes an understanding of accounting processes in both financial and managerial areas.

41.275 Computers in Accounting and Auditing 4 Q.H.
(Prereq. 41.257 or 41.272)

This course examines the use of computers in accounting and auditing. Topics include systems design and applications in accounting, internal control of computer-based systems, computer audit and control guidelines, and EDP audit tools and techniques.

Marketing

43.120 Introduction to Marketing 4 Q.H.
(Prereq. Middler standing)

This course consists of lectures, readings, and small-group discussions on the role of marketing in contemporary society, in the business enterprises, and in the nonprofit organization. Consideration is given to the planning, operation, and evaluation of marketing and promotional efforts necessary to the effective marketing of consumer and industrial products and services in both profit and nonprofit organizations.

43.122 Workshop in Negotiations 4 Q.H.
(Prereq. Junior or senior standing)

The objective of this course is to aid students in improving their understanding of the negotiations process and their ability to plan and conduct negotiations effectively. Class activities involve readings, lectures, and discussions, as well as numerous case discussions and live and videotaped role-play negotiation exercises.

43.135 Introduction to Retailing 4 Q.H.
(Prereq. Middler standing)

This course explores the range of retail firms that comprise the retailing industry, from large mass merchandisers to small specialty outlets.

The functions, practices, and organizations of various store types are examined. Current issues, career opportunities, the environment of retailing and retailing's role in the economy are among topics considered.

43.228 Marketing for Nonprofit Organizations 4 Q.H.

(Prereq. Middler standing)

This course examines the unique characteristics of marketing in public and nonprofit enterprises. It aims to expand the scope of marketing management concepts beyond the traditional setting of business. Particular attention is paid to the basic decision-making differences between public and private firms. The course involves case analysis, assigned readings, and a group project.

43.235 Marketing Channels 4 Q.H.

(Prereq. 43.120, or permission of instructor and junior or senior standing)

This course studies marketing structures and institutions: their evolution, functions, interrelations, and the management of their role in the marketing process.

43.236 Retail Merchandising and Control 4 Q.H.

(Prereq. 43.120 or permission of instructor)

This course examines the concepts and techniques of store operations and merchandise management. Topics such as calculating and planning markups and markdowns, pricing, inventory control, stock turn, open-to-buy, profitability analysis, and expense control are considered.

43.237 Retail Strategies and Problems 4 Q.H.

(Prereq. 43.120; junior or senior standing or permission of instructor)

This course considers strategic and policy decisions of major retail enterprises engaged in food, apparel, and general merchandise distribution. The evolution of retail institutions is analyzed along with the characteristics of and prospects for new store types.

43.240 Marketing Research 4 Q.H.

(Prereq. 43.252)

This course focuses on the survey research process and the analysis of data using "canned" computer programming routines. Among the topics covered are: 1) problem definition, 2) research design, 3) sampling techniques, 4) questionnaire development, 5) data collection methods, and 6) data analysis. Students are expected to work on group projects with participating firms. No previous computer experience required.

43.242 Sales Management 4 Q.H.

(Prereq. 43.252)

This course is designed to help the student develop decision-making skills necessary for both building and maintaining an effective sales or-

ganization. Cases and readings are used to examine the strategic and operating problems of the sales manager. Major topic areas include the selling function, sales management at the field level, and the sales executive.

43.244 Quantitative Methods in Marketing 4 Q.H.

(Prereq. 49.251)

This course focuses on statistical methods and techniques commonly used in the analysis and interpretation of survey and experimental data. "Canned" computer programs will be used extensively to illustrate the applicability of the methods discussed. No previous computer experience required.

43.249 Brand Management 4 Q.H.

(Prereq. 43.252)

This course focuses upon the management and development of brand strategies as well as the management of the product mix in the multi-product firm. Topics include evaluating and planning new consumer product introductions, identifying and screening new product opportunities, evaluating market performance, segmenting the product/market, and managing the product line.

43.252 Marketing Management 4 Q.H.

(Prereq. 43.120)

This course is designed to provide training in marketing decision making. Case studies simulating actual business settings are used to help students develop analytical abilities and sharpen their communications skills. Topics covered range from techniques used to analyze a market to the development of a total marketing strategy (product policy, pricing policy, promotion policy, and distribution policy).

43.261 International Marketing 4 Q.H.

(Prereq. 43.120)

This course is designed to help familiarize the student with those aspects of marketing that are unique to international business within the framework of traditional functional areas of marketing. The focus is on the environment and the modifications of marketing concepts and practices necessitated by environmental differences. Topics include cultural dynamics in international markets, political and legal environmental constraints, educational and economic constraints, international marketing research, international marketing institutions, and marketing practices abroad.

43.262 Advertising Management 4 Q.H.

(Prereq. 43.252)

This course focuses on the management of the advertising function in relation to a firm's overall marketing objectives. The course approaches the subject from the perspective of the user of advertising (e.g., product manager, marketing manager). Case studies and text material are used to help the student develop decision-making skills.

43.265 Industrial Marketing**4 Q.H.**

(Prereq. 43.252)

This course examines the marketing of products where business firms are the potential customers. Upperclass elective, open to juniors and seniors.

43.266 Marketing in the Service Sector**4 Q.H.**

(Prereq. 43.120)

The course provides a basic treatment of methods and techniques for marketing in the service sector, which includes sports, recreation, public service, banking, insurance, and hotels. In addition to the principles covered, a number of descriptive studies will be analyzed covering the application of such marketing principles in key service areas.

43.271 New Product Development**4 Q.H.**

(Prereq. 45.112)

For most firms, coping with the problems of environmental change through modification of the product line is both vital and difficult. This

seminar is concerned primarily with the examination and analysis of the problems firms face in directing and managing their new product development activities.

43.275 Foundations of Consumer Behavior**4 Q.H.**

(Prereq. 43.252)

This course is concerned with helping students develop an understanding of consumer attitudes and behavior processes as the basis of the design of marketing problems. Consideration is given to economic and behavioral models of consumer behavior and to underlying behavioral theories and concepts.

43.278 Competitive Strategy**4 Q.H.**

(Prereq. 43.252)

A capstone marketing course, required of all students with a marketing concentration. The focus is on the formulation of marketing strategy at a policy level and its implementation in a dynamic environment.

Finance and Insurance

44.120 Introduction to Finance**4 Q.H.**

(Prereq. 41.111, 41.112, and middler standing))

The objective of this course is to acquaint students with basic processes, principles, tools, and concepts of finance. Topics include financial analysis, financial forecasting, profit planning, budgeting, working capital management, and capital budgeting. The course also covers the basics of financial markets, institutions, and sources of supply of different types of funds available to a firm.

44.122 Taxes and Financial Decisions**4 Q.H.**

(Prereq. 39.105 and middler standing)

In this course, the case method is used to discuss a number of financial decisions that are greatly influenced by tax considerations, the most important of which are concerned with capital structure, dividend policy, acquisition terms, investment policies, and liquidations. The federal income tax receives primary consideration, but state and foreign taxes are also discussed.

44.126 Bank Management**4 Q.H.**

(Prereq. 44.120 and 44.275)

This course deals with the financial management of commercial banks and thrift institutions. The problems of liquidity and investment management, loan portfolio and capital management, and pricing problems associated with various sources and uses of funds are analyzed in the context of changing economic and regulatory environment for these institutions. The course is conducted through lectures, discussions, and cases

44.127 Seminar in Option Markets**4 Q.H.**

(Prereq. 44.120 and 44.275)

While puts and calls have been traded for many years, a market for listed options only appeared in 1973. Trading options on exchanges made such activity much easier and opened many more opportunities for both speculation and the protection of security positions. The purpose of this seminar is to explain the basic mechanics of this market, the characteristics of puts and calls, the techniques that may be applied, and current developments in the field. Students will be required to do individual research related to current methodology and concepts. Some knowledge of money and capital markets, as well as corporate finance, is necessary for those taking the course.

44.130 Seminar in Financial Futures**4 Q.H.**

(Prereq. 44.120)

This is a seminar in commodity futures markets centered in the area of financial futures, with special emphasis on interest rate futures. The course covers the methods of trading, margins, hedging, spreading futures contracts in treasury bills, commercial paper, treasury bonds, treasury notes, GNMA's, etc. Students prepare a seminar report on some aspect of the futures market.

44.144 Management of Financial Institutions**4 Q.H.**

(Prereq. 44.120)

This course offers a broad study of the decision-making problems faced by financial institutions such as commercial banks, savings and investment institutions, and finance companies when viewed as competitive, profit-seeking business

entities. Topics include the nature and scope of the capital markets confronting institutions, specialized problems regarding the sources and uses of funds of financial institutions, the nature of competition, the regulation of financial institutions, and strategic policy planning of financial institutions.

44.145 Securities Markets 4 Q.H.
(Prereq. 44.120)

This course aims to analyze the operation of the securities market. Striking a balance between descriptions analysis, the course provides students the opportunity to examine in detail the operation and function of investment bankers, broker-dealers, and securities exchanges. There is a thorough study of the mechanics of cash and margin accounts, trading options, and regulations affecting securities markets.

44.154 Managerial Finance 4 Q.H.
(Prereq. 44.120)

The objective of the course is to provide students the opportunity to gain knowledge of the advanced tools and concepts used in the management of funds. Topics include inventory and credit policies, risk, capital budgeting, financial structure, cost of capital, dividend policy, and valuation of a firm. Overall financial strategy and timing of its implementation are also examined. Specialized topics—mergers and acquisitions, financial failure, and financial policy for multinational firms—may be considered in the course.

44.159 Small Business Finance 4 Q.H.
(Prereq. 44.120)

This course utilizes the basic processes, principles, tools, and concepts of finance within the parameters of a small business to develop a complete financial plan that projects the future circular flow of funds by analyzing and then integrating the impact of both investment decisions (use of funds) and financial decisions (source of funds).

44.160 International Financial Management 4 Q.H.
(Prereq. 44.120)

This course introduces students to the international financial environment. Subjects include balance of payments, exchange rates, Eurocurrencies, foreign capital markets, etc. The financial policies and practices of companies involved in multinational operations are considered. Specific topics include capital budgeting; capitalization policies, the use of Eurocurrency and Eurobond markets, and foreign exchange risk management by the international firm.

44.162 A Risk Management Approach to Property and Casualty Insurance 4 Q.H.
(Prereq. 44.120)

The concepts of risk, uncertainty, risk management, and insurance are introduced. A compre-

hensive analysis of property and casualty insurance markets and products is presented from a buyer's perspective. Principal emphasis is placed on defining and analyzing alternative methods of treating risk in a business enterprise. The course discusses different risk management strategies and analyzes practical situations.

44.171 Real Estate Finance Analysis and Investment 4 Q.H.
(Prereq. 44.120)

This course provides students with a comprehensive overview of real estate finance. Factors affecting real estate investment are emphasized. Specific topics covered include: valuation (appraisal), market analysis, development, ownership types, short-term financing, mortgage markets, the impact of inflation on real estate investment and finance, and investment strategies. The course is designed for students interested in a general overview of real estate finance, as well as those intending to pursue further studies in real estate. Instruction is primarily through readings, lectures, and case discussions.

44.172 Entrepreneurial Decision Making In Real Estate 4 Q.H.
(Prereq. 44.171)

This course provides an overview of property acquisition, development, and management from an entrepreneurial perspective. Topics include planning, financing, cost control and management of construction, marketing; and joint ventures. All major land uses are considered. Instruction is primarily through lectures and case discussions. Some class sessions may be devoted to guest speakers from the real estate community.

44.173 Real Estate Finance and Investment Strategies 4 Q.H.
(Prereq. 44.171)

The objective of this course is to provide students the opportunity to acquire knowledge and skills for decision making in the context of organizational real estate investment strategies. Five general topical areas are covered: 1) measurement of risk and yield on real estate debt and equity investments; 2) comparison of the risk and return in real estate investments with other types of investments; 3) traditional and innovative financing techniques; 4) management of a real estate portfolio; and 5) development and implementation of real estate investment strategies. Instruction is primarily through lectures, readings, and case discussions.

44.181 Investment Management 4 Q.H.
(Prereq. 44.120 and 49.251)

This course offers a broad overview of the concepts, practices, and procedures of investment management. Areas covered include basic security types, security market operations, security analysis (both fundamental and

technical) and an introduction to portfolio management.

44.185 Long-term Financial Management 4 Q.H.
(Prereq. 44.120 and 44.154)

This course focuses on several phases of long-term finance. Particular attention is devoted to complex cases dealing with capital budgeting, new financing, and mechanisms (both public and private) used to raise long-term funds.

44.221 A Risk Management Approach to Employee Benefit Programs 4 Q.H.
(Prereq. 44.120)

The concept of risk management is employed to develop a framework for a systematic treatment of employee benefit programs. The risks associated with the employee are defined, methods used by an employer to handle these risks are reviewed, and the concept of cost minimization of employee benefit programs is introduced. Private insurance, Blue Cross/Blue Shield, and government programs are viewed as alternative financing mechanisms of employee benefit programs, and the benefits and costs of these institutional arrangements are discussed.

44.240 Personal Finance 4 Q.H.
(Not open to College of Business Administration students)

The course focuses on management of the total personal estate: budgeting, savings, insurance, investments, borrowing, taxes, Social Security, pensions, annuities, securities markets, mutual funds, and their integration.

44.241 Personal Financial Management 4 Q.H.
(Prereq. 44.120)

The course places emphasis on the development of personal financial management expertise based on an integrated plan for personal choices in which alternative courses of action are judged by their contribution to the attainment of the decision maker's particular set of economic objectives. The overall personal economic plan is the consistent focus of the course and unites such diverse topics as inflation and investment selection, insurance, short- and long-run hedges against the purchasing power risk, purchasing assets, etc. The course is decision oriented and attempts to expose students to alternative courses of action and lead them toward a rational solution by developing techniques of estimating the success probabilities of alternative methods.

44.246 Essentials of Finance and Investments 4 Q.H.
(Prereq. Middler standing; non-business students only)

A survey of the scope and nature of business finance and investment management. Topics include financial analysis, budgeting, and capital expenditure decisions. An overview of financial

markets is presented. Stocks, bonds, and other financial instruments are discussed, both as a source of funds for businesses and as investments for individuals and institutions. Techniques of security analysis and portfolio management are introduced.

44.275 Money and Business Activity 4 Q.H.
(Prereq. Middler standing)

The course aims to provide students an understanding of the financial environment faced by a firm as well as the financial institutions serving the economy. The course discusses the forces that determine the changes in money and capital markets and explores the implications of changing financial environment for the management of funds in a firm and/or financial institution.

44.291 Seminar in Finance Theory 4 Q.H.
(Prereq. 44.120 and 44.154)

The course involves a discussion of the different theories related to the financial policies of business organizations and an analysis of the contributions of various theorists in finance. It covers topics such as debt capacity, capital budgeting under uncertainty, cost of capital, dividend policy, and the capital asset pricing model. The policy implications, limitations, and underlying assumptions of various theories are incorporated into the course.

44.292 Honors Seminar in Finance Theory 4 Q.H.
(Prereq. Participant in Honors Program only)
See Course Description for 44.291.

44.294 Modern Portfolio Management 4 Q.H.
(Prereq. Honors participant or permission of instructor)

The course seeks to analyze the methods of selection, revision, and performance measurement of asset portfolios. The student will be exposed to the current and most modern methods of asset portfolio building used in business today. The concept of an efficient frontier of assets in the risk-return space will be presented and evaluated. The efficient frontier theory is used to identify the gains available from diversification and to select those securities or assets that best contribute to the goals of the portfolio. Included in the course is a simulated equity fund management project. An efficient portfolio-building software package is available to the students to help them in their analysis. Each student must initially select a number of equity securities to satisfy the stated objectives of his/her fund. At the end of the course the student must prepare and present an annual report evaluating the portfolio's construction and performance, with recommendations for revision. The course requires the student to bring a core knowledge in the areas of statistical analysis, accounting methods, and basic finance theories.

Management

45.106 International Labor Relations Systems

(Prereq. 45.210) 4 Q.H.

This course analyzes the labor relations systems of selected countries in comparison with that of the United States. The political, cultural, and economic forces that shaped these systems are also studied. Special attention will be given to such international institutions as multinational companies and the EEC. There will be cases, readings, and projects assigned.

45.112 Business Policy 4 Q.H.

(Prereq. 45.210)

This course focuses on corporate strategy and its elements, including an analysis of the company, its resources, opportunities, environment, and decision makers. Emphasis is on decision making and implementation of strategy while operating a company in the context of a business simulation.

45.130 Opportunity Analysis and Venture Capital 4 Q.H.

This course is concerned with the essential tasks performed prior to establishing a new venture. These include finding a suitable business opportunity or developing an idea for a product or service; analyzing the feasibility of the opportunity or idea; developing a business plan; structuring the venture team; seeking sources of seed capital; and forming a venture action plan for beginning operations.

45.160 Operations Planning and Control 4 Q.H.

(Prereq. 45.265)
This course focuses on the planning and control necessary for an enterprise to respond to customer demand. Specific topics include the design of the planning and control system, inventory planning and control, forecasting for operations planning, and operations scheduling.

45.209 Organization Behavior 4 Q.H.

(Prereq. Middler standing)
This course explores the effects of individual, interpersonal, group, and leadership factors on human behavior. Managerial applications of behavioral and social science concepts are also explored, including job design, job satisfaction, performance appraisal, supervision, career dynamics, and organizational change. Emphasis is placed on helping the student develop skills in dealing with the human side of enterprise.

45.210 Complex Organizations 4 Q.H.

(Prereq. Middler standing)
The course examines the structure and dynamics of the complex organization. Focus is on the design of the organization and its basic sub-systems (reward, control, selection, development). Students have the opportunity to explore how organizational structures help shape human behavior. Emphasis is on understanding the

interrelations among organizational structures, tasks, and individual characteristics within the context of a changing environment.

45.212 New Venture Creation: A Career Choice (Prereq. Middler standing) 4 Q.H.

This course is designed to assist students interested in small business in answering a number of important questions through a systematic analysis of their own potentials for entrepreneurial careers: What is involved in starting my own business? What is my own entrepreneurial orientation and commitment? What managerial and behavioral skills do I need for achievement? How can I plan for my personal and entrepreneurial goals? Case discussions, self-assessment, goal-setting exercises, guest speakers, and a student-selected project are used.

45.216 Managerial Skills Seminar 4 Q.H.

(Prereq. 45.210)
This course offers a study of the nature of managerial work focusing on three key managerial roles—interpersonal, informational, and decisional. Behavioral determinants of administrative effectiveness are examined with an emphasis on the practical implications of and personal orientations to those key managerial roles.

45.218 Motivation and Control 4 Q.H.

(Prereq. 45.210)
This course provides an extensive analysis of various theories of motivation, including Herzberg's two-factor theory, expectancy theory, learning theory, need theory (McClelland), and competence motivation. This course also considers the behavioral implications of various organizational systems of measuring and controlling operations.

45.220 Managing Human Resources for the Non-business Student 4 Q.H.

This course applies concepts from the behavioral and social sciences to the problems of managing human resources in the workplace. Specific topics include motivation, communication, interpersonal behavior and conflict resolution, leadership, group behavior, and organizational change. In addition, particular current techniques in human resources management will also be explored, including performance management, career management, and career development.

45.250 Business and Society 4 Q.H.

(Prereq. 45.210 and junior standing)
This course offers an analysis of environmental influences—economic, legal, technical, social, cultural, and ethical—affecting the corporation. The focus is on managerial decision making and relieving the tensions generated by these external factors.

45.263 Career Exploration and Self-Assessment**4 Q.H.**

(Prereq. 45.210)

This course examines the tools for both self-assessment (investigating one's skills, abilities, needs, values, and interests) and career exploration (determining the nature of and requirements for entering and succeeding in various career fields). The goal of the course is to help students develop an individualized plan of action that summarizes a wide variety of data indicating an individual's present status and career goals, and the means by which to bridge the gap.

45.265 Operations Management**4 Q.H.**

(Prereq. 49.251)

Operations Management is concerned with the productive system of an enterprise whereby inputs of technology, materials, personnel, and information are transformed into useful goods and/or services. The principal objective of this course is to introduce the student to the types of problems and issues encountered by the operations manager. Various models and techniques will be discussed, but the emphasis is on problem formulation and managerial implications.

45.267 Strategies of Organizational Changes**4 Q.H.**

(Prereq. 45.210)

This course focuses on three basic areas: (1) organizations as stable systems that naturally resist both planned and unplanned change; (2) organizations as dynamic systems that continuously respond to both internal and external pressures for change; and (3) strategies and techniques for designing, implementing, and managing change. The role of the change agent will be discussed in this context.

45.268 Selection and Assessment of Employees**4 Q.H.**

(Prereq. 45.209)

The course examines three influences of employee selection and testing: first, the legal aspect of selection, where the greatest uncertainty is found; second, the influence of industrial psychology on selection and decision-making techniques; and third, the area of personnel practices itself, that is, the methods employers find effective in coping with legal requirements. Basic issues and procedures such as EEO, decision strategies, and the utility and evaluation of selection and appraisal systems will be covered.

45.269 Interpersonal Relations Through Transactional Analysis**4 Q.H.**

(Prereq. 45.210)

Using a simplified behavioral vocabulary, Transactional Analysis becomes a language and way of thinking about the nature of interpersonal relations. As an applied skill, transactional analysis may help teach one how to improve communications and relations between individuals. Transactional analysis has been used

as a training technique by dozens of companies in such areas as improving the interpersonal skills of customer-contact personnel, implementing affirmative action programs, and improving superior-subordinate relations.

45.272 People and Productivity: Human Resources Management**4 Q.H.**

(Prereq. 45.209)

This course is designed to help students develop understanding of contemporary issues in human resource management. Problems posed by changing work patterns, labor force characteristics, union activities, and government policies are examined. Organizational experiments such as worker participation, job enlargement, and group incentives are discussed and evaluated from a managerial perspective.

45.273 Personnel Administration**4 Q.H.**

(Prereq. 45.210)

This course explores basic traditional personnel functions, with an emphasis on the role of the personnel specialist. Functions include recruitment, selection, placement, training, and development of employees, as well as reward systems such as money and promotions. The recent challenge of new regulatory systems, such as affirmative action and occupational safety and health, on employment planning will be covered.

45.274 Contemporary Labor Issues**4 Q.H.**

(Prereq. 45.210)

The course provides a study of current issues dealing with labor in its broadest sense. Labor unions and manpower institutions as well as the emerging development and training problems motivated by unemployment, poverty, and changing work patterns are discussed. Recent legislation dealing with the employment relationship is reviewed.

45.275 Labor Law**4 Q.H.**

(Prereq. Middler standing)

The purpose of this course is to help acquaint the student with the many constitutional and legal problems involved in labor organizing, industrial relations, labor negotiations, labor contract enforcement, and dispute resolution. Cases are studied for the legal principles underlying the common law, state and federal laws, and the constitutional questions of power and authority. The Sherman Act, Clayton Act, Norris-LaGuardia Act, and Labor Management Relations Act are considered.

45.276 Seminar In Collective Bargaining**4 Q.H.**

(Prereq. 45.210)

The course focuses on the organization, negotiation, and administration of collective-bargaining relations between management and unions in different industries, services, and levels of government. Simulations of actual bargaining and an arbitration exercise are also a part of the course.

45.277 Reward Systems: Wage, Salary, and Benefits Administration 4 Q.H.
(Prereq. 45.210)

This course examines one of the major functions of personnel administration—compensation management—and its part in the overall personnel programs of the organization. The analysis of reward systems as supportive mechanisms of management and the formulation of compensation policy and implementation of compensation systems are developed through simulation exercises and group projects, as well as lectures and cases.

45.278 Leadership 4 Q.H.
(Formerly 45.258, Dynamics and Practice of Superior-Subordinate Relations)
(Prereq. 45.210)

This course offers a study of the leadership function in a variety of organizational settings. Using a contingency approach, this course explores a range of possible leadership behaviors, relating the appropriateness of a particular style to a number of situational factors. Readings provide an opportunity to explore several contingency theories of leadership; cases allow for the application of these models; and videotaped role playing and self-assessment techniques permit the student to evaluate his/her own leadership style.

45.279 The Changing Workplace: an On-Site View of Industrialization 4 Q.H.
(Prereq. 45.210)

America, and New England in particular, is noted as the place where the genius of industrial innovators and managers brought the industrial revolution to its first real flowering. This course deals in depth with the interactions of technical, economic, social, and managerial factors as they evolved in forming industrial New England. Emphasis is on the nineteenth century although forces will be traced from colonial New England to the present. Focus is on the participants in this dynamic free enterprise process—the managers and workers—and the settings in which they worked and lived. The seminar format includes on-site studies of factory settings, mill reconstructions, museums, and the communities in which developments took place. The seminar also includes films, lectures, and individual tutorials. Each student is required to complete a research project.

45.284 Seminar in Business-Government 4 Q.H.
The seminar is a research oriented course in which students have the opportunity to explore the topic of business-government relationships. The course is conducted within the framework of a competition by General Motors Corporation. A series of topics will be researched and several reports produced. These will be merged into a single report which will serve as the basis for a group presentation to General Motors representatives who will come to Northeastern for

this purpose. Prior presentation will be given by students to interested faculty and members of the administration. Grading will be based primarily on final reports and interim reports as well as proposals from groups.

45.285 Honors Seminar in Business—Government 4 Q.H.
(Prereq. Open to honors participants only)
See course description for 45.284.

45.288 Honors Course—The Changing Workplace: An On-Site View of Industrialization 4 Q.H.
(Prereq. Open to honors participants only)

45.288 Seminar on the Management of Innovation 4 Q.H.
(Prereq. Honors participant or permission of instructor)

The management of technological innovation is of critical importance to American companies as they face increasing worldwide competition. Knowledge in the area is advancing rapidly and incorporates work from several disciplines, including strategy, marketing, organizational behavior, and finance. This course will be run as a research seminar. Students will be responsible for identifying relevant topics in the management of innovation and completing a research study. Students can work either individually or in small groups on the research topic they define. Students will be required to submit a research proposal, a progress report at mid-quarter, and a final paper and presentation.

45.289 Public Policy in Private Enterprise: An Evaluation of Government 4 Q.H.
(Prereq. Honors participant or permission of instructor)

The course will address the major forms of regulation from classic industry—specific regulation and anti-trust to socially motivated regulation such as equal employment opportunity and environmental protection. The goal of the course is to increase students' understanding of the regulatory arena and to analyze the regulatory function. The course will culminate in an individual term research project and an oral presentation.

45.290 Honors Course—The Japanese Company: A Study in Comparative Management 4 Q.H.
(Prereq. Honors participants or permission of instructor)

This course will compare the Japanese company with the American company. Study includes the historical and political-social-economic contexts in which the Japanese company operates. A research project requiring library and field research is required. The course probes the management practices of U.S.-based companies owned and operated by Japanese corporations, the results of American firms that have tried to adopt a Japanese model for U.S. operations, and the reality and myth of "Japan, Inc."

45.292 Honors Course—Designing Innovative Organizations**4 Q.H.**

(Prereq. Honors participant or permission of instructor)

This course focuses on how high-technology firms must be designed and managed to perform effectively and to develop and bring new products to market. Students will be involved in: 1) the study of literature pertaining to these issues; 2) the collection of data on the above issues by interviewing members of high-technology firms and administering questionnaires; 3) analysis of the data in an attempt to discover how effective firms function; and 4) writing of a report based on their study. Students will thus be exposed to the techniques and requirements of research, have an opportunity to deal with executives and managers in high-technology firms, and be asked to critically evaluate new, as well as existing, literature on the subject of organization design and theory.

45.293 Risks and Rewards of Entrepreneurship Honors Course**4 Q.H.**

(Prereq. Honors participants or permission of instructor)

Anxiety and exhilaration run neck and neck through the small business experience. The degree to which these extremes of emotion occur has not been thoroughly studied. So far, research has concentrated on the backgrounds and attributes of entrepreneurs rather than on the psychological and physiological "fallout" from running their companies. The purpose of this honors seminar will be to identify situations and issues that can cause entrepreneurs stress, on the one hand, and satisfaction, on the other.

45.294 Regulation and Its Reform: An Evaluation of Government Regulation of Business Honors Course**4 Q.H.**

(Prereq. Honors participants or permission of instructor)

Why are airline fares behaving so erratically? What are the potential effects on telephone prices and services since the ATT breakup? What is the "bubble policy" and how will it help the environment? These are just a few of the questions that will be addressed in this course through current readings and informal class dis-

cussions. What should a student take away from this course? First, he or she should have an increased understanding of regulatory theory and structure, but more importantly he or she should begin to comprehend how strong governmental influences have affected the present business environment and how the government business relationship may change in the future.

45.295 Small Business Institute Project**8 Q.H.**

(Prereq. Junior standing; one entrepreneurship course or permission of instructor)

The Small Business Institute Field Project was brought into existence with the cooperation of the Small Business Administration (SBA) and some of its client companies in greater Boston. A student team is expected to interact with a smaller company, helping management to analyze opportunities and problems facing the business, and to develop practical recommendations for the company's decision makers. Students are expected to allocate approximately one day per week to the project, including on-site work with the company owner-managers with whom they have been paired and to participate in related research, report preparation, and presentation of results. This real-world experience is blended with occasional class meetings and frequent team meetings with a faculty member to discuss the field work and to explore alternatives. Interim progress reports and a final report are presented to the client company, SBA, and the class.

45.296 Corporate Strategy Honors Course**4 Q.H.**

(Prereq. Honors participants or permission of instructor)

This course will deal with establishing corporate strategies and policies at the top level. Each of several small teams of students will be expected to study a corporation, its competitors, and its industry; describe its strategic behavior; and suggest ways in which its strategy could be improved. Drawing on his experience as a CEO, corporate director, and consultant, the instructor will discuss key strategic issues with the class and assist them in analyzing and meeting officials of the firms they choose to study. One term paper and no examinations.

Also see course 30.205, Writing for the Professions: Business Administration.

International Business Administration

46.100 Introduction to International Business

(Prereq. Midlevel standing)

4 Q.H.

This focuses on the cultural, economic, and political aspects of domestic and foreign environments and their effect on the international operations of business firms. Topics covered include 1) the principles, patterns, and potential of international trade and investments; 2) the development of management strategies for inter-

national businesses; and 3) the organization and management of the firm's international operations.

46.101 Seminar in International Business**4 Q.H.**

(Prereq. 46.100)

This course applies the concepts and skills acquired in other international and domestic courses to the solution of managerial problems. It focuses on the task of solving significant

managerial problems in international and foreign cultural contexts. Students' reports form a major part of this course and are expected to concentrate either on a functional business area related to international operations or on analyses of market opportunities and methods of entry in a foreign environment. Other instructional vehicles include case analyses and discussions of current issues.

46.102 Comparative International Management (Prereq. Middler standing) **4 Q.H.**

The objective of this course is to help to develop the student's conceptual and analytical abilities to: 1) identify and analyze management systems in various national settings and 2) understand the impact of economic, social, political, and cultural variables on management systems.

Transportation

48.101 Principles of Transportation **4 Q.H.**
(Prereq. 39.105 and middler standing)

Topics include the political, social, and economic functions of transportation; development and structure of the domestic transportation system; the nature of government regulation and promotion of the several modes.

48.102 Current Issues in Transportation Policy (Prereq. 48.101) **4 Q.H.**

This course provides an overview of the regulatory process and its impact on the domestic transportation system; critical examination of topical policy issues that confront carriers, shippers, and the agencies of regulation.

48.103 Carrier Management **4 Q.H.**
(Prereq. 48.101)

This course examines the transportation system from the carrier's viewpoint; managerial response to a heavily regulated and rapidly expanding environment; focus on carrier decision making involving routes, scheduling, financing, and pricing of services.

48.104 Physical Distribution Management **4 Q.H.**
(Prereq. Middler standing)

This course is concerned with movement, distribution, and control of raw material and finished goods flows. Examination of the importance of inventory control, scheduling, warehousing, and transportation in the design and operation of distribution systems.

48.105 Urban Transportation **4 Q.H.**

This course focuses on the movement of people and freight in and around metropolitan areas. Study includes a management approach to the planning, implementation, and operation of mass transit systems. Interrelations of transit with other urban programs, the auto mode, and the government/public sector will be discussed.

48.103 Environmental Pressures and the Multinational Corporation **4 Q.H.**
(Prereq. 45.209 and 45.210)

Rapid multidimensional change in the world environment creates substantial pressures on corporations—especially large multinationals. The purposes of this course are to identify and evaluate: 1) environmental pressures most likely to have impact in the coming decade(s); 2) planning approaches that may be useful to the manager in analyzing the changing world environment; and 3) possible corporate responses to any environmental pressures. This course is designed both for students in international business and for those who have a general interest in the changing environment.

48.106 Air Transportation **4 Q.H.**
(Prereq. 48.101)

The course offers a managerial perspective on economics and regulation of aviation. The course probes aspects of commercial aviation, passenger and cargo, transportation and key areas of general aviation.

48.108 Transportation Labor **4 Q.H.**
(Prereq. 48.101)

This course focuses on the significance of the labor component in the transportation industries. Attention is devoted to trends in employee compensation, productivity, and bargaining patterns. Also examined are the role of government in this area and the impact of transportation labor on shippers, carriers, and consumers.

48.110 International Transportation and Distribution Management **4 Q.H.**

This course examines the present and future status of United States and world ocean and air transportation in international trade and development. The economic, regulatory, financial, and operating characteristics of these forms of carriage are examined with primary emphasis given to their impact on international trade patterns. Other topics include government promotion, subsidy, and technological innovation.

48.120 Seminar in Transportation and Distribution **4 Q.H.**
(Prereq. 48.120 and 48.104)

This is a discussion- and research-oriented course that focuses on a limited number of advanced transportation and distribution topics. Included is interaction with business and government through individual research on the topic chosen for presentation by the student.

Also see course 49.262 for Independent Study.

General Business

49.100 Introduction to Business 4 Q.H.

This course focuses on the business organization as a system of interrelated functions and operations, the interactions between the organization and its environment, and the role of management in business organizations.

49.107 Management of Smaller Enterprises 4 Q.H.

This is a general management course that focuses upon the strategies and operating problems of smaller, already established business enterprises. The course is designed for individuals who are considering entrepreneurial careers or careers in management, finance, or marketing within the smaller-company environment. Discussion will explore the characteristics and urgencies of problems that smaller companies are likely to encounter at different stages in their evolving life cycle, from the postnatal period to the more mature stage.

49.124 Honors: Seminar in Research 4 Q.H. (Prereq. 49.251)

This seminar focuses on the definition of research in the context of the business environment, research methodologies, and the student's attempt at research through a term project. Methodological issues include the formulation of concepts, hypotheses, and theories; the design of research projects; data collection; data analysis; and report writing. The term project involves investigation of a subject of interest to the student. The projects are intended to serve as prototypes of honors theses.

49.155 Legal Aspects of Business 4 Q.H.

This course examines the legal aspects of business transactions and business relationships involving contracts; sales, bulk transfers, and secured transactions under the Uniform Commercial Code; principal and agency; and suretyship and guaranty.

49.157 Management Information Systems 4 Q.H. (Prereq. 49.205 and junior standing)

This course will examine the design, implementation, and operation of management information systems (MIS), and those characteristics of MIS that have the greatest impact on the effectiveness and efficiency of business organizations. Emphasis will be placed on computer-based systems that support managerial decision making, planning, and control. The course will include a computer project using a data base management system.

49.205 Introduction to Data Processing 4 Q.H.

This course is designed to introduce the business student to those aspects of modern data processing techniques vital to his/her future job performance. During the first part of the course, the student will have the opportunity to learn to

program in the BASIC language on the University's VAX 11/780 time-sharing system. The second part of the course deals with the history of data processing, computer hardware and software, and an overview of the creation and operation of management information systems.

49.210 The Law of Business Organizations and Commercial Paper 4 Q.H. (Prereq. 49.155)

This course is an introduction to the legal aspects of the typical forms of business organizations, partnerships, corporations, and the rights, responsibilities, and liabilities involved. The course also covers the law governing commercial paper under the Uniform Commercial Code, and the Bankruptcy Reform Act of 1978.

49.212 Law of Wills, Trusts, and Estates 4 Q.H.

Topics include requirements of valid will, claims of and against estates; the administration of estates, both formal and informal; essential elements for the creation of a trust; kinds of trusts, including inter vivos and testamentary trusts; the rights, responsibilities, and liabilities of trustees; and the rights of beneficiaries.

49.214 Decision Analysis 4 Q.H. (Prereq. 49.251)

This course focuses on the analysis of decision making with particular emphasis on realistic problems under uncertainty. The course aims to help improve the student's ability to make better decisions through a careful consideration of alternative courses of action and their consequences, relevant objectives, and the element of risk. Topics include the basic components of decision problems, the concepts of risk and utility, decision trees, and value of information and multicriteria decision making.

49.215 Bulk Sales and Bankruptcy 4 Q.H.

In examining bulk transfers, a detailed study is made of the Uniform Commercial Code, Article 6; the need of the transferor to give to the transferee a sworn list of all his creditors; the giving of notice to the listed creditors; the contents of the notice, what creditors are protected; and the legal consequences of failure to comply with the Code. The bankruptcy aspects of the course deal with both voluntary and involuntary bankruptcies; the appointment and duties of the trustee; provable and dischargeable debts; priority of debts; discharge and acts that bar a discharge.

49.240 Law in Society 4 Q.H. (Prereq. Middler standing)

The course is designed to provide students the opportunity to acquire a broad view of their legal rights, obligations, and responsibilities in their relations with others and with the state. Includes study of torts such as assault and battery, trespass, negligence, slander, libel, and deceit;

and crimes such as homicide, assault and battery, robbery, arson, larceny, and burglary.

49.249 Introduction: Quantitative Methods In Business 4 Q.H.
(Prereq. 10.119)

A model is a simplified representation or abstraction of reality. The focus of this course is on the representation of systems or managerial problems in the form of mathematical models and their application to problem solving in business. Criteria for selecting an appropriate model description are discussed and specific techniques for development examined, including linear programming, differential calculus, and the use of descriptive statistics.

49.250 Business Statistics I 4 Q.H.
(Prereq. 49.249)

Statistics is a methodology concerned with data collection, analysis, and interpretation. Information generated by statistical methods is used for analyzing decisions in the face of uncertainty. This course introduces fundamental concepts and methodology of probability, probability distribution, Bayesian revisions, estimation, and hypothesis testing.

49.251 Business Statistics II 4 Q.H.
(Prereq. 49.250)

Continuation of 49.250. Topics include chi-square tests, simple and multiple regression-correlation analysis, and elementary concepts of decision theory.

49.262 Independent Study 4 Q.H.

For a student who has received approval of a proposal to undertake independent study in lieu of any course required in the various concentrations. Each teaching area considers proposals presented by students to its independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study will take place. A copy of the final report prepared by the student will be presented to the appropriate independent Studies Committee. Further information about the Independent Studies Program can be obtained from area coordinators.

49.263 Independent Study 4 Q.H.
Same as 49.262.

49.264 Independent Study 4 Q.H.
Same as 49.262.

49.265 Independent Study 4 Q.H.
Same as 49.262.

49.266 Independent Study (Honors) 4 Q.H.
Directed study toward fulfillment of Honors Program requirements. Open only to students who have been accepted into the Honors Program. Procedures for arranging the Honors Independent Study are the same as those for 49.262.

49.280 Business Data Analysis
Honors course 4 Q.H.
(Prereq. Honors participant or permission of instructor)

One activity that every organization has to face is making decisions. Data analysis is a valuable input to such decision making. This course will examine various situations in decision making when data analysis can be helpful. This will involve both short-term and long-term forecasting problems. It will also examine the issue of causal modeling through a regression type of model.

49.291 Decision Analysis with Multiple Objectives 4 Q.H.
(Prereq. Honors participant or permission of instructor)

This course examines normatively oriented approaches to decision making with multiple conflicting objectives. Topics include the identification of decision criteria, courses of action and their consequences, assessment of risk and uncertainty, multiattribute preference models and utility assessment through tradeoff analysis, nondominated decision alternatives, "satisficing," and other approaches. Discussions will include assigned case problems and a term project to be completed by each student.

49.292 Independent Study 2 Q.H.

For a student who has received approval of a proposal to undertake independent study in lieu of any course required in the various concentrations. Each teaching area considers proposals presented by students to its Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study will take place. A copy of the final report prepared by the student will be presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from area coordinators.

49.293 Independent Study 3 Q.H.
Same as 49.292

93.118 Cultural Aspects of International Business 4 Q.H.

Using a managerial perspective, this course will cover issues that arise when a firm moves from its home country to a host country that may have a different national culture. Although it will usually take the perspective of the U.S.-based firm that operates abroad, it will spend some time on what happens to other national firms operating in the United States and in third country environments. The way in which "corporate culture" evolves in the context of national culture and the impact on managers will be a central issue.

Foundations of Education

50.114 Education and Social Science 4 Q.H.

An interdisciplinary course, that draws on anthropology, psychology, and sociology, and exposes students to some of the concepts, methods, and terminology of these fields. Main themes are the evolution of human nature, the influence of previous experience and learning on the behavior of individuals and groups, difficulties in achieving a full degree of humanity in a technological society, and the potentially powerful roles that "professional socializers" (teachers, clinicians, group leaders, etc.) can play in the lives of students and clients. Required for freshmen in the Boston-Bouvé College of Human Development Professions (except Physical Therapy); open to other students as an elective; prerequisite for subsequent courses in Social Foundations (50.161-50.168).

50.121 Human Development and Learning I

4 Q.H.

Developmental processes from prenatal life up to adolescence. Theories of learning and personality with research and case material covering major aspects of psychological development.

50.131 Human Development and Learning II

4 Q.H.

Basic overview of the continuity of human development in contemporary society, from the pre-adolescent period through adolescence, adulthood, middle age, and old age. Significant areas of growth, development, and adjustment for each period are considered, including social, sexual, personality, motivational, and cognitive aspects. 50.021 is *not* prerequisite for this course.

50.132 Creative Expression in Children 4 Q.H.

(Prereq. 50.121)

Designed to assist students who are interested in working with children in a variety of settings. Discussion focuses on the potentials of creative expression in interpersonal communication; the relation of children's creative experiences to their cognitive, emotional, and social development; and related topics that will provide students the opportunity to acquire experience and confidence in working with various media available for creative expression.

50.133 Educational Applications of Social Psychology

4 Q.H.

(Prereq. 50.121 or 50.131)

Focus is on theory and research in social psychology especially relevant to education. Areas covered are prejudice in the classroom; the school as a setting for manifestation of authoritarian personality; attitude organization and change in an educational environment; the class and the clique as "small groups"; the expression

of need for achievement in various school structures; related topics.

50.134 Mental Health in Teaching

4 Q.H.

(Prereq. 50.121 or 50.131)

Factors involved in the choice of teaching as a career and psychological and occupational factors that contribute to teacher happiness, dissatisfaction, adjustment, and maladjustment. Examination of these factors is a background against which to consider: 1) what teachers can do to foster healthy personalities; 2) how to deal with psychological forces in the classroom; and 3) steps to strengthen the emotional development of the normal child.

50.135 Cross-Cultural Studies of Child Rearing and Education

4 Q.H.

(Prereq. 50.121 or 50.131)

Child rearing and child life in contrasting cultures around the world. Emphasis is on cognitive, emotional, and behavioral outcomes of concern to American educators, human services workers, and parents. Consideration is given to alternative patterns of child rearing possibly useful in modern society. Readings focus primarily on ethnographic descriptions of particular cultures and psychological comparisons of children from contrasting backgrounds.

50.136 Language and Cognition: Educational Implications

4 Q.H.

(Prereq. 50.121 or 50.131)

Development of language and thought in the child: concept learning, problem solving, and language acquisition. Particular consideration given to the implications of current research and theory in these areas for educational practice.

50.137 Seminar in Adolescent Psychology 4 Q.H.

(Prereq. 50.131)

In-depth examination of motivational, intellectual, social, and emotional development of adolescents, from end of pre-adolescence to beginning of young adulthood. Special attention is given to current issues such as drug use, sexual behavior, and vocational choice. Each student is expected to examine a topic of choice in some depth.

50.138 Seminar in Human Learning and Motivation

4 Q.H.

(Prereq. 50.121 or 50.131)

Survey and analysis of the literature on human learning and motivation. Emphasis on interaction between human learning and motivation in the developmental process and the classroom.

50.139 Seminar in Early Childhood Development

(Prereq. 50.121)

4 Q.H.

The theory and research regarding the cognitive, personality, and social development of children

from birth to six years, with respect to the implications for early childhood education. Various existing programs examined and new directions explored.

50.141 Measurement and Evaluation 4 Q.H.
(Prereq. 51.135)

The fundamentals of measurement: the use of basic statistical concepts and techniques; evaluation of standardized and teacher-made tests.

50.142 Introduction to Educational Statistics 4 Q.H.

Emphasizes descriptive statistics useful in the evaluation of educational and related professional activities. Topics ordinarily covered include statistical notation, variability, probability, sampling techniques, linear regression, correlation, t-tests, and chi-square tests of significance. Examples of applications of these techniques will be drawn, so far as possible, from the fields for which students in the course are preparing, and may vary from quarter to quarter.

50.152 Comparative Education 4 Q.H.

A comparison of the national school systems of selected foreign countries with the school system in the United States. Course content includes comparative data in the fields of teaching, speech and hearing, special education, and human services.

50.153 Philosophy of Education 4 Q.H.

Objective is to help participants examine their own purposes in relation to those of the school as an institution. Course reading material will consist primarily of philosophical writings on topics such as the ethics of educational intervention, the delineation of educational concepts, the educational messages of long-range speculations and utopias, and normative assumptions underlying educational policies.

50.154 Current Issues in American Education 4 Q.H.

An analysis of the variety of current issues confronting teachers, speech and hearing clinicians, special education practitioners, and human services specialists. Attempts will be made to place these issues in a historical context.

50.161 Seminar in Group Process 4 Q.H.

A study of the structure, dynamics, and function of face-to-face groups to learn about goal achievement and task orientation. The course operates mainly by committee or group instrumentation. The serious student should work to gain an understanding of the function of informal relationships within formal organizations, the various roles within groups, peer relationships, superior-subordinate relationships, authority and intimacy, and the inclusion and exclusion processes.

50.162 Day Care and Nursery Schools: Social and Cultural Origins 4 Q.H.

An exploration of the origins of the increased contemporary use of out-of-the-family child care arrangements in the United States and in selected European and Third World nations. Course topics include the interrelation of industrialization, technology, and family functioning; contrasting varieties of child care centers in operation today; and effects of the proliferation of child care centers on other aspects of society, such as neighborhood life, business, parents' lifestyles, elementary school curricula, government spending, and the job market in education and human services. Two to four hours per week of fieldwork in a child care center are required of each student.

50.163 Schools as Social Systems 4 Q.H.
(Prereq. 50.114 or equiv.)

Analysis of schools as sociocultural subsystems within the larger society. Functional interrelation between student and school subcultures, status and role systems, authority structures in American schools. During most quarters, one section of this course focuses on elementary and secondary schools and a second focuses on day care centers and nursery schools; students preregistering should choose the appropriate section.

50.164 Class and Ethnic Relations in Education 4 Q.H.
(Prereq. 50.114 or equiv.)

The various ways in which the American class system and patterns of ethnic group relations have affected, and have been affected by, American education. The limitations and potential of educational institutions with respect to the resolution of intergroup conflicts and the establishment of equal educational opportunities.

50.165 Organization and Politics of School Systems 4 Q.H.
(Prereq. 50.114 or equiv.)

The political sociology of school systems in the United States. An analysis of the power and authority structures in contemporary education. Who decides what and how? Who controls the system? How are the various interest groups organized? What are the mechanisms for conflict resolution? The relation between professional and nonprofessional interest groups.

50.166 The Human Services Professions 4 Q.H.
(Prereq. 50.114, 21.100, or equiv.)

Explores what a human service agency is, how it comes into being, how it grows and changes. Attitudes, values, skills, and knowledge of the human services worker are analyzed, as are reasons why people in modern society require human services assistance. Human services are viewed from the eyes of clients as well as society as a whole. Fieldwork in a human service

agency is a major course component, as is a good deal of independent study. Required for all human services majors; open to other students on space-available basis.

50.167 Education and Psychosocial Development 4 Q.H.
(Prereq. 50.114 or equiv.)

(Prereq. 19.135 for human services majors)
Theories and research on the socialization functions of education. Topics covered include the relative influence of early vs. post-childhood socialization; the role of diverse educational experiences and institutions in personality development and change. Human services majors should arrange to take specially designated sections of this course, offered most quarters, after completing 19.135, Personality I.

50.168 Education and Social Change 4 Q.H.
(Prereq. 50.114 or equiv.)

A sociological exploration of educational systems as independent and dependent variables in social change. Instances of planned educational change in various countries and their implications for contemporary American society.

50.190 Directed Study 4 Q.H.
(Prereq. Permission of instructor)

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and the Dean's Office of the Boston-Bouvé College of Human Development Professions. Approval forms must be submitted to the Dean's Office during the quarter prior to registration for the Directed Study.

Curriculum and Instruction

51.123 Fundamentals of Reading I 4 Q.H.

This is the introductory course in developmental reading for prospective Early Childhood and Elementary teachers. Emphasis is on language and symbolic process as it relates to beginning reading. Areas of skill development, such as word recognition and meaning comprehension, are studied in detail, as are some methods and techniques of testing and grouping. Also included are an introduction to some reading books and materials, methods of teaching, and the psychology of learning to read.

51.125 Introduction to Reading 4 Q.H.

This introductory course for noneducation majors provides an overview of the most common current approaches to teaching reading and writing, diagnosis and planning. Case studies, video-taped lessons and direct observations in the Reading Clinic are analyzed and interpreted. The relationships between speech and hearing development and dysfunction and reading and writing are investigated.

51.126 Teaching Reading to Adolescents and Adults 4 Q.H.

For English and social studies majors in the Boston Bouvé College of Human Development Professions who are preparing for teaching in the junior or senior high school. Emphasis is on language and symbolic process, word recognition, and meaning comprehension, and on methods and techniques of testing and grouping.

51.134 Fundamentals of Reading II 4 Q.H.

A continuation and extension of Fundamentals of Reading I. Study skills; speed and fluency

development areas. The tutorial work is extended and the student is given further opportunity to achieve familiarity with books, materials, and methods.

51.135 Analysis of the Instructional Process† 4 Q.H.

Students examine conflicting theories about the nature of teaching and learning. The effects of traditional and innovative educational systems upon learners are evaluated. Educational tools for analyzing and evaluating various aspects of learning environments are identified and their use by students is refined during sequential field observations.

51.137 Remedial Reading 4 Q.H.
(Prereq. 51.134)

For prospective teachers, this introductory course may assist in familiarizing the student with some of the most commonly known reading problems in the typical classroom as well as in the Reading Clinic; analysis and evaluation of the typical diagnoses of such problems corrective programs. Tutorial work with a retarded reader, with each student keeping a log or journal of work with a particular reading problem.

51.138 Linguistics and Reading 4 Q.H.
(Prereq. 51.134)

The major objective is to translate the knowledge gathered from linguistics with useful classroom instruction, which includes not only reading instruction, but basic instruction in the related language skills. The contributions,

†Requires a minimum of twenty hours of related experience in a school approved by the course instructor.

particularly of such writers as Fries, Barnhart, Bloomfield, Chomsky, and LeFevre, are experimented with and analyzed.

51.139 Writing and the Teaching of Writing **4 Q.H.**
(Prereq. 51.135)

A study of the logical and rhetorical bases of exposition and argumentative writing; relationships of assumptions, assertions, and implications; the nature of proof in the sciences, social sciences, and the humanities; strategies of argumentation; the effective consequences of word choice and sentence structure.

51.146 Reading/Study Skills I **4 Q.H.**

Designed to provide instruction in study and organizational skills to students who demonstrate a need in these areas. The skills of previewing, locating the main ideas and related details, outlining, summarizing, note taking, and vocabulary development will be explored and applied to the content of courses that students may be taking as part of their requirements.

51.148 Reading/Study Skills II **4 Q.H.**
(Prereq. 51.146 and instructor's consent)

This course is an extension of Reading/Study Skills I and will expand upon such previously examined topics as organizational skills necessary for effective handling of text materials, note taking, vocabulary development, and comprehension. New topics include preparing for and writing examinations, writing and revising research papers, and an introduction to library skills. All skill work is expected to be applied to concurrent coursework.

51.150 Supervised Field Placement: Early Childhood **2 Q.H.**

(Prereq. Early Childhood sequence through 41.142)

A University-arranged institutional placement to allow students the opportunity to provide educational, remedial, and/or custodial services to children generally of ages two through five. Opportunity will be provided to analyze, develop, demonstrate, and evaluate skills and techniques in guiding the activities of children in nursery schools, day care centers, and/or kindergartens.

51.151 Student Teaching and Seminar **8 Q.H.**

(Prereq. Formal acceptance into and completion of advanced professional sequence with minimum 2.0 q.p.a., both overall and in teaching major)

Full-time participation in a university-arranged and -supervised school program designed to provide opportunity for the analysis of learning and teaching and for the demonstration, evaluation, and development of teaching skills.

51.152 Literature and Learning Materials for Children and Young Adults **4 Q.H.**

This course offers a comprehensive survey of the field of children's literature and literature for young adults. Although it is designed specifi-

cally for prospective teachers (and, in fact, is required of all Early Childhood and Elementary Education majors), it may also be taken as an elective by all students. Students will survey and evaluate examples of contemporary children's literature and other learning materials used in preschool, elementary, secondary, and remedial programs. Covered in this course are such recurring themes as: racism and sexism in children's books; controversial books for young children; contemporary illustrators; banned books, etc.

51.153 Current Issues in Teaching the Gifted and Talented **4 Q.H.**

Students will examine issues that affect the type and quality of education available to the gifted and talented in the United States. Various approaches and programs will be described and evaluated, and conclusions will be reached about their effectiveness. Research findings on the needs of this segment of the population of learners will be examined in order to provide some criteria for future curriculum development.

51.154 Fundamentals of Math and Science I (Emphasis/Math)† **4 Q.H.**

This is the first of two sequential courses in methods and materials of mathematics and science teaching for Early Childhood and Elementary Education majors. This course provides the opportunities for University students to explore various strategies and materials of teaching mathematics in a manner that takes in account the developmental stages of children.

51.155 Fundamentals of Math and Science II (Emphasis/Science) **4 Q.H.**

This is the second of two courses in methods and materials of mathematics and science teaching for Early Childhood and Elementary Education majors. This course offers the student the opportunity to explore some limited but varied content areas in science and to consider how these areas can be taught to children.

51.156 Elementary Education Curriculum I† **4 Q.H.**

Various patterns of organizing elementary school curriculum are analyzed on the basis of the general objectives of the public school system in the United States. Students are expected to evaluate and to organize units of work that can accommodate children at different developmental levels. The integrated approach to curriculum organization is emphasized with language arts, music, and arts as central focus.

51.157 Elementary Education Curriculum II **4 Q.H.**

Social Studies curricula in use in elementary schools are evaluated, utilizing criteria that relate to significant content from the social sciences and democratic processes. Students

are expected to develop independent units of work that apply to the social needs of learners and to various communities and cultures. Aspects of art, music, life-styles and values of groups will be integrated into these units.

51.158 Education for the Future:

A Creative and Humanistic Approach 4 Q.H.

Students in this course will be given the opportunity to gain a perspective on the array of conflicting learning experiences that bombard their lives; to identify the factors that influence what people learn and from whom; to evaluate the potential effects of these learnings. As a consequence, the students will be encouraged to develop frames of reference through which to examine their own roles in the education process. A creative and humanistic approach to teaching is the basis for all the work in this course.

51.163 Methods and Materials for

Teaching Adolescents and Adults I 4 Q.H.

Consideration of specific methods and materials appropriate to teaching adolescents and adults to develop in the students an understanding of the complexities of the materials and methodology of the teaching-learning process, to encourage within students attitudes conducive to and identified with good tenets of teaching, to foster in the students acceptance of the need to grow constantly and to be aware of the continuing development of the learning-teaching process.

51.164 Methods and Materials for

Teaching Adolescents and Adults II 4 Q.H.

This course is sectioned according to the various subject areas of teaching techniques of organizing and presenting lessons, developing

teaching materials, using audiovisual equipment, developing and implementing evaluation instruments, and selecting appropriate materials within the field of interest.

51.165 Fundamentals of Curriculum

Development

4 Q.H.

An examination of how goals and objectives are selected and priorities are determined. Methods for designing educational programs to meet specified goals and methods of evaluating educational outcomes in terms of the goals of the program, and techniques for modifying programs in the light of such performance.

51.190 Directed Study I

4 Q.H.

(Prereq. Permission of chairman and associate dean)

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department.

51.191 Directed Study II

4 Q.H.

For students who have completed 51.190.

53.110 Intervention Strategies for the Human

Services

4 Q.H.

(Prereq. 50.166; 50.121 and 50.131 or 19.105 and 19.106; 29.117 or 29.141; 50.133 or 50.161; 19.135; 19.202)

Introduction to the wide range of skills used in working with clients in the various helping professions, e.g., counseling (individual and group), advocacy, rehabilitation, community organizing, income maintenance, etc. Taught primarily through role playing, simulations, and interviews with practicing professionals; also readings, but no fieldwork requirement. Intended as preparation for more specialized courses. Required for Human Services majors but open to other students with appropriate backgrounds.

Education—Counseling

53.114 Introduction to Counseling

4 Q.H.

(Prereq. Junior standing)

This course presents an exposure to major theoretical approaches to counseling. Students will receive training and practice in listening skills and are expected to develop facilitative responses. Classroom work will combine didactic presentations and experiential activities to assist students in understanding and implementing a variety of counseling approaches.

53.115 Introduction to Group Counseling 4 Q.H.

(Prereq. 53.114)

This course provides a foundational exposure to the theory and skills of group counseling as it is practiced in various human service settings. Topics cover developmental stages of counseling groups; approaches to leadership style, and strategies for starting, maintaining, and terminating the counseling group. The course

includes an opportunity for students to practice rudimentary skills of leadership of counseling groups and to become involved in focused group process activities.

53.112 Introduction to Family Systems

Counseling

4 Q.H.

(Prereq. 53.114)

This course provides an introduction to the concepts and skills of family systems therapy, a counseling orientation in which the family is the chosen social unit of assessment and intervention for the client's problem. The course covers major approaches within communications and structural frameworks, emphasizing implications for normal family development and interventions in dysfunctional systems, and addresses theory and strategies for working with marital and parenting subsystems. Course offers students a beginning opportunity to experi-

ence the manner in which their family affects their functioning in various social systems with which they have professional contact.

53.111 Case Management: Diagnosis and

Treatment 4 Q.H.

(Prereq. 21.100 or 50.114; 50.121-50.131 or 19.105-19.106; 21.157; 50.166)

The course offers an introduction to the basic theory and skills of managing client's treatment

programs in a variety of institutional settings. Students receive training to identify the components of a psychosocial assessment, examine commonly used techniques of planned service delivery and resource coordination, and review the diverse entitlements that are available to clients of diverse needs and backgrounds. Much of the instruction will occur in a seminar-like format.

Speech-Language Pathology and Audiology

55.122 Introduction to Speech and

Hearing 4 Q.H.

Course offers an overview of disorders of speech and hearing and their treatment, and a review of normal speech and hearing development. Clinical observations of persons with speech, language, and hearing disorders are required.

55.123 Speech Science 4 Q.H.

(Prereq. 55.122 and 55.125)

Course offers an examination of the basic sciences involved in speech and audition, including in-depth study of the analysis of sound and the acoustic composition of speech. Emphasis is placed on a review of current theory and research in speech reception, perception, and production.

55.125 Hearing Science 4 Q.H.

(Prereq. 55.122)

Basic concepts related to the physics of sound are presented, followed by an in-depth study of the anatomy and physiology of the normal hearing mechanism. In addition, basic principles of psychophysics of audition are discussed.

55.126 Anatomy and Physiology of Vocal

Mechanisms 4 Q.H.

(Prereq. 55.122)

Course offers an in-depth study of the static structure, musculature, and physiology of the speech mechanism. Current research in speech physiology is emphasized.

55.127 Introduction to Psychoacoustics 4 Q.H.

(Prereq. 55.123 or 55.125)

This course explores the physics of sound and the psychological aspects of hearing with an emphasis on clinical applications. Topics include threshold, loudness, pitch, adaptation, and auditory localization. The prerequisite may be waived only with permission of the instructor.

55.128 Psychoacoustics Laboratory 4 Q.H.

(Prereq. 55.127)

This course provides practical application of topics discussed in 55.127. Students are required to re-create some of the most interesting of the classical psychoacoustics experiments. The prerequisite may be waived only with permission of the instructor.

55.131 Developmental Semantics and

Syntax 4 Q.H.

(Prereq. 55.122)

Course provides an analysis of the emerging semantic and syntactical aspects of language in normal and atypical children, with emphasis on discussion of current theory and research in language acquisition. Clinical observations of children with normal and atypical language patterns are required.

55.133 Phonetics and Developmental

Phonology 4 Q.H.

(Prereq. 55.122 and 55.126)

Course offers a basic training in auditory recognition and symbolization of phonemes and allophones in major American dialects. Static and dynamic articulatory descriptions are stressed. Course also includes a review of the developmental sequence of phonemic acquisition.

55.141 Phonemic Disorders 4 Q.H.

(Prereq. 55.126, 55.131, and 55.133)

Course provides a practical and theoretical examination of the phonemic disorders and their etiology; diagnostic tools for evaluation and methods of treatment. Clinical observations of persons with phonemic disorders are required.

55.142 Introduction to Audiology 4 Q.H.

(Prereq. 55.125)

Course focuses on the basic techniques of audiometric testing and hearing conservation, including a review of basic hearing sciences and a pre-practicum and lab experience in hearing testing.

55.143 Diagnostic Techniques 4 Q.H.

(Prereq. 55.131, 55.133, 55.141)

Course offers a presentation and review of diagnostic tests and procedures in speech pathology. Emphasis is on the parent interview; the oral examination; and the appraisal of phonemic, phonatory, language, fluency, and auditory disorders. Observations of diagnostic evaluations are required.

55.144 Orientation to Clinical Practices

(Prereq. Senior status) 4 Q.H.

This is a pre-practicum course designed to introduce students to the policies of ASHA; to offer exposure to related health professions; to

discuss the influence of state and federal legislation upon the delivery of speech-language and hearing services; to examine the role of the clinical supervisor; and to practice writing clinical goals and lesson plans.

55.154 Fluency Disorders 4 Q.H.

(Prereq. 55.126)

Course offers a comprehensive study of the various theories of stuttering from the earliest historical references through the nineteenth and twentieth centuries. Clinical observations are required.

55.155 Clinical Practice and Seminar 4 Q.H.

(Prereq. 55.144)

Course provides full-time participation in a University-arranged and -supervised school program designed to provide the student with initial involvement in the clinician-client relationship and an opportunity to demonstrate, evaluate, and develop clinical skills.

55.159 Basic Manual Communication Systems 4 Q.H.

Course focuses on the use of manual communication systems in deaf education (Manual English, SEE, and Signed English). Discussions will cover the goals and assumptions underlying these systems, their relation to American Sign Language and English, and the application of these systems in educational and clinical systems. Instruction is provided in Introductory level English Sign Language.

55.160 Directed Study 4 Q.H.

(Prereq. Permission of instructor)

This course is provided for the student whose unique academic needs or interests cannot adequately be satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and the Dean's Office of the Boston-Bouvé College of Human Development Professions. Approval forms must be submitted to the Dean's Office during the quarter prior to registration for the Directed Study.

Special Education and Rehabilitation

56.120 Introduction to Special Education 4 Q.H.

A survey of the characteristics and the social, emotional, and educational adjustment of special-needs individuals. The effects of society's attitudes, the individual's own attitude toward the handicap, and the effect of the handicap itself are evaluated. Current legislation will be reviewed.

56.121 Introduction to Learning Disabilities

(Prereq. 56.120) 4 Q.H.

This course surveys behavioral characteristics of children who present specific deficits in perceptual, integrative, or expressive processes that impair learning efficiency. Students are expected to work to develop competencies in diagnosing curriculum materials and teaching methods.

56.124 Diagnostics in Special Education 4 Q.H.

(Prereq. 56.120 and 56.121)

Students should work to develop competence in 1) observing, recording, and analyzing children's behavior and learning environments, including continuous measurement and informal assessment of general, specific, and behavioral learning needs; and 2) techniques of formal assessment of general, specific, and behavioral learning needs.

56.126 Methods and Materials of Teaching in Special Education 4 Q.H.

(Prereq. 56.120, 56.121, 56.124, or senior status)

Course instruction will focus on the following areas: 1) development and implementation of individualized educational plans, including task analysis, adaptation and selection of materials,

strategies in applied classroom management techniques; and 2) adaptation and selection of materials and strategies in language arts, mathematics, and perceptual-motor skills.

56.130 Introduction to Emotional Disturbances in Children 4 Q.H.

(Prereq. 56.120 or permission of instructor)

Review of emotional processes that interfere with learning behavior and a study of approaches used to deal with behavioral disorders. Emphasis is on classroom management techniques, use of consultation, and parent-teacher interaction.

56.135 Socio-Psycho Dynamics of Family Life 4 Q.H.

An introduction to and survey of the internal and external dynamics of family life. The significance of such dynamics to the mental health of the special-needs child will be examined. The approaches to working with parents and the school-home relationships, as well as the effects of disability on the family, are explored.

56.140 Psychology of the Mentally Retarded 4 Q.H.

Analysis of the etiology, nature, and needs of the retarded individual, emphasizing cognitive and psychosocial development. Implications of these characteristics for life-span management are explored in conjunction with parental and community attitudes and involvement.

56.150 Introduction to Rehabilitation 4 Q.H.

Overview of and orientation to the field of rehabilitation, including its historical development, psychological implications, and socio-

logical dimensions. Special attention is paid to rehabilitation of specific disability groups such as the physically disabled, emotionally disturbed, mentally retarded, alcoholic, drug dependent, and public offender.

56.190 Directed Study **4 Q.H.**
(Prereq. Permission of instructor)

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and of the Dean's Office of the Boston-Bouvé College of Human Development Professions. Approval forms must be submitted to the Dean's

Office during the quarter prior to registration for the Directed Study.

93.230 Field Experience in Human Services I **4 Q.H.**

Human Services students are required to fulfill two fieldwork placements during the last two years of their program. Each placement consists of 150 hours on site. The type of placement varies according to the student's interest. Field experiences are supervised by University staff to maximize the student's learning opportunity.

93.231 Field Experience in Human Services II **4 Q.H.**

(Prereq. 93.230 and senior status, permission only)
Continuation of 93.230.

Physical Education

62.10A Beginning Swimming **1 Q.H.**
Instruction in basic swimming skills, with emphasis on personal water safety.

62.10B Intermediate Swimming **1 Q.H.**
(Prereq. 62.10A or equiv.)
Instruction in basic and advanced swimming skills, with emphasis on form and efficiency.

62.10G Water Polo **1 Q.H.**
(Prereq. 62.10B or equiv.)
Instruction in beginning water polo, with emphasis on personal skill, offensive and defensive team play.

62.10H Advanced Life Saving **2 Q.H.**
(Prereq. 62.10B or equiv.)
Instruction in Red Cross life-saving skills, techniques, and theory. Red Cross certification is possible.

62.10L Water Safety Instructor **2 Q.H.**
(Prereq. 62.10B, 62.10K)
Instruction in techniques, theory, and teaching methods in swimming and life-saving courses. Red Cross certification is possible.

62.10M Beginning Scuba **2 Q.H.**
(Prereq. 62.10B or equiv.)
Instruction in basic skin-diving and scuba-diving skills, with emphasis on personal safety.

62.10R Small Crafts **1 Q.H.***
Introduction to basic skills in sailing.

62.12A Folk and Square Dance I **1 Q.H.**
Introduction to folk and square dance at the beginning and intermediate levels.

62.12E Modern Dance I **1 Q.H.**
Introduction to modern dance technique and style.

62.12F Modern Dance II **1 Q.H.**
(Prereq. 62.12E or equiv.)
A continuation of 62.12E with progression to more complex modern dance techniques and

movement combinations. Practice in the use of improvisation for exploring dance movement.

62.12G Modern Dance III **1 Q.H.**
(Prereq. 62.12F or equiv.)
A continuation of 62.12F with progression into the expressive and choreographic use of modern dance techniques.

62.12H Ballet I **1 Q.H.**
Introduction to the fundamentals of classical ballet; its vocabulary, structure, and style.

62.12J Ballet II **1 Q.H.**
(Prereq. 62.12H or equiv.)
A continuation of 62.12H. Progression into the expressive and choreographic use of classical ballet techniques.

62.12K Ballet III **1 Q.H.**
(Prereq. 62.12S)
A continuation of 62.12J with an in-depth study of complicated variations derived from the classical ballet technique.

62.12L Jazz Dance I **1 Q.H.**
Introduction to jazz dance techniques and styles.

62.12M Jazz Dance II **1 Q.H.**
(Prereq. 62.12L or equiv.)
A continuation of 62.12L with progression to more complex jazz dance techniques and combinations.

62.12N Jazz Dance III **1 Q.H.**
(Prereq. 62.12M or equiv.)
A continuation of 62.12M and progression into the choreographic process of jazz dance.

62.12P Rhythmic Analysis **1 Q.H.**
(Prereq. Physical education major or permission of instructor)
Analysis of rhythm as it applies to movement skills and basic dance.

62.12Q Aerobic and Disco Dance **1 Q.H.**
An introduction to fitness through aerobic and disco dancing.

*Lab fee required

- 62.12R Ballroom Dance** 1 Q.H.
An introduction to traditional and contemporary ballroom dance.
- 62.12S Dance Improvisation/Composition** 1 Q.H.
(Prereq. 62.12E, H, or L)
Practice in the use of dance as a medium for artistic expression. Emphasis on the development of skill in the use of improvisational techniques. The student is expected to participate in creating and structuring short dance compositions.
- 62.13V Beginning Gymnastics I** 1 Q.H.
(Prereq. 62.13P or equiv.)
A coeducational approach to knowledge of and basic skills in floor exercise, vaulting, balance beam, parallel bars, uneven bars, high bar, and rings.
- 62.13W Women's Gymnastics II** 1 Q.H.
(Prereq. 62.13V)
Focus is on knowledge and skill necessary in performing the beginning compulsory routines on the balance beam, floor exercise, uneven bars, and vaulting.
- 62.13X Women's Gymnastics III** 1 Q.H.
(Prereq. 62.13W)
Skill and knowledge related to the performance of optional routines in the four areas of competitive women's gymnastics.
- 62.13Y Men's Gymnastics II** 1 Q.H.
(Prereq. 62.13V)
Skill and knowledge related to the performance of beginning compulsory routines on the high bar, side horse, rings, floor exercise, parallel bars, and vaulting horse.
- 62.13Z Men's Gymnastics III** 1 Q.H.
(Prereq. 62.13Y)
Skill and knowledge related to performance in optional routines on the high bar, side horse, rings, floor exercise, parallel bars, and vaulting horse.
- 62.14A Badminton** 1 Q.H.
Instruction in basic badminton strokes, concepts, rules, strategies, and game play.
- 62.14C Tennis** 1 Q.H.
Instruction in basic tennis strokes, concepts, rules, strategies, and game play.
- 62.14E Intermediate/Advanced Badminton** 1 Q.H.
(Prereq. 62.14A)
Instruction in badminton, including intermediate and advanced skills, with emphasis on singles and doubles match play and strategy.
- 62.14G Intermediate/Advanced Tennis** 1 Q.H.
(Prereq. 62.14C or equiv.)
Instruction in tennis, including intermediate and advanced skills, with emphasis on singles and doubles match play and strategy.
- 62.15A Movement Education** 1 Q.H.
Concepts and techniques in movement education and exploration for elementary school educators.
- 62.15B Beginning Archery** 1 Q.H.
Selected skills in target shooting and practical experience in archery games, novelty events, and conduct of tournaments.
- 62.15D Beginning Bowling** 1 Q.H.*
Focus is on development of knowledge and skill necessary for competent performance in bowling at the beginning level. Practice provided in nearby commercial alleys.
- 62.15F Beginning Golf** 1 Q.H.
Instruction in fundamental golf skills, knowledge of clubs and their use, and golf etiquette.
- 62.15H Beginning Self-Defense** 1 Q.H.
A survey of the principles and fundamental skills. Instruction is geared to the beginning and intermediate levels.
- 62.15I Karate** 1 Q.H.
Fundamental techniques of unarmed combat for self-defense using the punches, kicks, and blocks of Tae Kwan Do/Karate.
- 62.15J Beginning Boxing** 1 Q.H.
Instruction in boxing at the beginning level; emphasis on offensive and defensive techniques, scoring, training, and officiating.
- 62.15K Beginning Wrestling** 1 Q.H.
Beginning level of instruction in basic wrestling maneuvers. Stress on fundamental breakdowns, escapes, takedowns, rides, and pinning combinations. Rules and scoring procedures discussed and modified matches conducted.
- 62.15M Beginning Fencing** 1 Q.H.
Instruction in basic foil fencing, including introduction to competition.
- 62.15N Intermediate/Advanced Foil Fencing** 1 Q.H.
(Prereq. 62.15M or equiv.)
Instruction in intermediate/advanced techniques of foil fencing, with special emphasis on competition, judging, and the use of electrical equipment.
- 62.15Q Karate II** 1 Q.H.
(Prereq. 62.15I)
Continuation of 62.15I, with progression to more complex techniques and combinations of punches, kicks, and blocks related to Tae Kwan Do/Karate.
- 62.15R Roller Skating** 1 Q.H.
Instruction for beginners in recreational roller skating skills.
- 62.15S Beginning Ice Skating** 1 Q.H.
Instruction for beginners in recreational ice skating skills.

*Lab fee required.

- 62.15T Figure Skating** 1 Q.H.
(Prereq. 62.15S or permission of Instructor)
Instruction in beginning and intermediate figure-skating skills.
- 62.15Y Yoga** 1 Q.H.
Introduction to yoga skills and techniques for men and women at the beginning level.
- 62.16B Weight Training** 1 Q.H.
Introduction to the principles and use of resistive exercises: isotonic exercise (weights), isometric exercise, and the appropriateness of each.
- 62.16C Physical Conditioning** 1 Q.H.
Instruction in assessing one's personal physical fitness level with emphasis placed on establishing a personal exercise regimen based upon scientific principles of training. Special sections will be designated which use different mediums of exercise, such as aerobic dance techniques, running, and circuit training.
- 62.16I Beginning Cross-Country Skiing** 1 Q.H.
Instruction in the fundamental techniques of cross-country skiing.
- 62.16L Beginning Track and Field** 1 Q.H.
Instruction in the fundamental skills in the various track and field events.
- 62.16M Intermediate/Advanced Track and Field** (Prereq. 62.16L or equiv.) 1 Q.H.
Instruction in intermediate/advanced techniques in track and field events. Emphasis is placed on improvement of individual skills; techniques of officiating are discussed.
- 62.16P Beginning Handball** 1 Q.H.
Knowledge and skills appropriate to handball at the beginning level.
- 62.16R Beginning Racquetball** 1 Q.H.
Knowledge and skills appropriate for performance in racquetball at the beginning level.
- 62.16S Beginning Skiing** 1 Q.H.
The course offers instruction in fundamental techniques of downhill skiing.
- 62.16T Intermediate Skiing** 1 Q.H.
(Prereq. 62.16S)
The course provides instruction in downhill skiing, including intermediate and advanced techniques, with emphasis on skill development.
- 62.17C Basketball** 1 Q.H.
Knowledge and skills appropriate for performance in basketball at the beginning level.
- 62.17D Intermediate/Advanced Basketball** 1 Q.H.
(Prereq. 62.17C)
Knowledge and skills appropriate for performance in basketball at the intermediate to advanced levels.
- 62.17J Volleyball** 1 Q.H.
Knowledge and skills appropriate for playing volleyball at the beginning level.
- 62.17L Field Hockey** 1 Q.H.
Knowledge and skills appropriate for playing field hockey at the beginning level.
- 62.17P Football** 1 Q.H.
Fundamental skills and knowledge appropriate for beginning level performances in football.
- 62.18C Softball** 1 Q.H.
Knowledge and skill appropriate for performing in softball at the beginning level.
- 62.18E Baseball** 1 Q.H.
(Prereq. 62.18C or permission of instructor)
Knowledge and skill appropriate for baseball at the intermediate and advanced levels.
- 62.18G Women's Lacrosse** 1 Q.H.
Knowledge and skill appropriate for performance in lacrosse at the beginning level.
- 62.18J Men's Lacrosse** 1 Q.H.
Knowledge and skill appropriate for performance in lacrosse at the beginning level.
- 62.18M Soccer** 1 Q.H.
Knowledge and skill appropriate for performance in soccer at the beginning level.
- 62.19B Games and Activities for Children** 2 Q.H.
Introduction to simple ball games, running and tag games, self-testing activities, movement exploration, and rhythms appropriate for children. Course content appropriate for future parents, teachers, and youth leaders.
- 62.116 Early Childhood Development** 4 Q.H.
A study of the development of fundamental motor patterns (run, catch, kick, strike, jump, throw) from ages 0 to 5 years, including perceptual-motor relations operating in vision, audition, and proprioception.
- 62.200 Human Movement** 3 Q.H.
An introduction to the nature and role of human movement and the analysis of skillful movement performance through participation and observation. Introduction to the objectives, literature, and organization of the profession of physical education.
- 62.202 Life/Career Planning** 3 Q.H.
An examination and exploration of careers in physical education and related fields. The course provides an opportunity for students to assess personal skills and abilities, to research jobs of interest, and to practice specific career-planning skills.
- 62.204 Psychology of Sport** 2 Q.H.
(Prereq. P.E. or permission of instructor)
The psychological analysis of behavioral patterns and deviations of sports participants, including spectators and coaches. Emphasis on emotions, motivation, competition, and learning factors. Discussion of current sports highlights.
- 62.205 Group Dynamics I** 3 Q.H.*
(Prereq. 62.202)
An introduction to group dynamics through selected activities, discussion, and living and working together. A resident-living experience for one week at the Warren Center is an integral part of the course.

*Lab fee required.

62.206 First Aid 2 Q.H.

First-aid procedures recommended for the home, school, and community. Emphasis on practices endorsed by the American Red Cross.

62.208 Sociology of Sport and Dance 2 Q.H.

(Prereq. Permission of instructor)

The study of sport and dance as social institutions, including theories explaining the role of each in contemporary society and the part of each in evolving societies.

62.209 History and Philosophy of Physical Education 3 Q.H.

A survey of physical education from ancient times to the present. The influence of major philosophical positions upon the nature of physical education programs is analyzed.

62.211 Comparative Physical Education 3 Q.H.

(Prereq. 62.210 or 50.152)
Analysis of systems of physical education and sport in selected countries and their interrelations with the larger cultural framework.

62.212 Theory of Coaching 2 Q.H.

(Prereq. Permission of instructor)

An analysis of learning principles, sociology, and psychology as applied to coaching individual, dual, and team sports. Techniques and standards of squad recruitment, organization, leadership, and coaching ethics are presented.

62.216 Elementary School Activities 3 Q.H.

Focus is on introductory knowledge and skills necessary for teaching physical education to elementary-school-aged children. Students are expected to learn about children's performance and appropriate teaching techniques through observation and actual experience in off-campus schools and learning centers. Course is designed to satisfy partially the pre-practicum requirements for teacher certification at the K-9 level.*

62.217 Theory of Play 2 Q.H.

The nature of play and a study of cross-cultural patterns of play. An investigation of selected theories of play, including Huizinga, Caillouis, Sutton-Smith, and Lee.

62.219 Secondary School Activities 3 Q.H.

Physical activity appropriate for secondary school youth is studied in relation to their level of development and interest. Students are expected to learn about pupils' performance and appropriate teaching techniques through observation and actual experience in off-campus schools and learning centers. Course is designed to satisfy partially the pre-practicum requirements for teacher certification at the grades 5-12 level.*

62.220 Perceptual-Motor Development 4 Q.H.

(Prereq. 50.121 and 50.131; may be taken concurrently)

Course offers a study of the development of motor skills from birth through infancy, early childhood, adolescence, and adulthood, including skilled performance of the aged. Age expectations for perceptual-motor behavior are considered, with a focus on a functional adequacy in skilled performance.†

62.221 Perceptual-Motor Learning and Development 3 Q.H.

(Prereq. 50.121)

Interrelation of movement behavior and perceptual-motor organizations of vision, audition, and proprioception. A brief overview of major theories of learning as they apply to learning motor skills.

62.222 Perceptual-Motor Learning 4 Q.H.

(Prereq. 19.149, 19.156, 19.157)

A focus on the way information processing is involved in perceptual-motor learning and performance. Basic research data are applied to learning and executing skills in a variety of sports settings.

62.24B Swimming Analysis 2 Q.H.

(Prereq. 62.10B or permission of instructor)

Instruction in theory, analysis techniques, and teaching methods in swimming.

62.24E Analysis and Coaching of Men's Gymnastics 2 Q.H.

(Prereq. 62.13Z)

Skill analysis and coaching of men's gymnastics, with emphasis on appropriate teaching methods, new trends, and judging.

62.24F Analysis and Coaching of Women's Gymnastics 2 Q.H.

(Prereq. 62.13X)

Skill analysis and coaching of women's gymnastics, with emphasis on appropriate teaching methods and new trends.

62.24G Advanced Analysis and Judging of Women's Gymnastics. 2 Q.H.

(Prereq. 62.13W)

Advanced skill analysis techniques and instruction in judging women's gymnastics. May serve as preparation for judging certification.

62.24H Analysis and Coaching of Badminton 2 Q.H.

(Prereq. 62.14E)
Analysis of performance and methods of teaching and coaching in badminton.

62.24J Analysis and Coaching of Tennis 2 Q.H.

(Prereq. 62.14G)

Analysis of performance and methods of teaching in tennis.

*Teacher certification requirements available in 106 Dockser Hall.

†Designed to partially satisfy pre-practicum requirements for teacher certification.

62.24K Analysis and Coaching of Fencing 2 Q.H.
(Prereq. 62.15N)

Advanced skill analysis and coaching of fencing. Special emphasis on current research and teaching methods.

62.24L Analysis and Coaching of Golf 2 Q.H.*
(Prereq. 62.15F or equiv.)

Advanced skill analysis and coaching of golf. Special emphasis on course play and teaching methods.

62.24M Analysis and Coaching of Track/Field 2 Q.H.
(Prereq. 62.16M or equiv.)

Advanced skill analysis and coaching techniques for selected track and field events. Special emphasis is placed on the analysis of common movement patterns, teaching methods, and coaching techniques.

62.24N Analysis and Coaching of Wrestling 2 Q.H.
(Prereq. 62.15K or equiv.)

Analysis of performance and techniques of teaching selected wrestling skills are covered in detail. Application of research to methodology is stressed.

62.24P Analysis and Coaching of Baseball 2 Q.H.
(Prereq. 62.18E)

The basic techniques and responsibilities of coaching interscholastic and intercollegiate baseball, including advanced skill analysis, position and team play, conditioning, practice organization, and team management.

62.24Q Analysis and Coaching of Basketball 2 Q.H.
(Prereq. 62.17C)

The basic techniques and responsibilities of coaching interscholastic and intercollegiate basketball, including advanced skill analysis, position and team play, conditioning, practice organization, and team management.

62.24R Analysis and Coaching of Field Hockey 2 Q.H.
(Prereq. 62.17L)

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate field hockey, including advanced skill analysis, position and team play, conditioning, practice organization, and team management.

62.24S Analysis and Coaching of Football 2 Q.H.
(Prereq. 62.17P)

The basic techniques and responsibilities of coaching interscholastic and intercollegiate football, including advanced skill analysis, team conditioning, offensive and defensive systems, practice organization, team management, and coaching staff organization.

62.24V Analysis and Coaching of Lacrosse 2 Q.H.
(Prereq. 62.18G or 62.18J)

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate lacrosse, including advanced skill analysis, position and team play, conditioning, practice organization, and team management.

62.24W Analysis and Coaching of Soccer 2 Q.H.
(Prereq. 62.18M)

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate soccer, including advanced skill analysis, position and team play, conditioning, practice organization, and team management.

62.24X Analysis and Coaching of Softball 2 Q.H.
(Prereq. 62.18C)

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate softball, including advanced skill analysis and management.

62.24Y Analysis and Coaching of Volleyball (Men-Women) 2 Q.H.
(Prereq. 62.17J)

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate volleyball, including advanced skill analysis, position and team play, conditioning, practice organization, and team management.

62.24Z Analysis and Coaching Special Problems 2 Q.H.
(Prereq. Permission Dept. chairperson)

Designed as directed study in a sport or activity not offered by the Department or in special scheduling situations.

62.248 Clinical Athletic Training 2 Q.H.
(Prereq. 62.256)

The student athletic trainer's introduction to clinical experience with an opportunity to practice the various skills for evaluation and treatment of the injured athlete.

62.250 Anatomy and Physiology I 4 Q.H.
(Prereq. 62.250)

Gross anatomy and physiology of the human skeletal, joint, nervous, and muscular systems.

62.251 Anatomy and Physiology II 4 Q.H.
(Prereq. 62.250)

Gross anatomy and physiology of the human cardiovascular, respiratory, digestive, urinary, and endocrine systems. Metabolism, calorimetry, and other applied topics will also be covered.

62.253 Kinesiology I 4 Q.H.
(Prereq. 62.250 or equiv.)

Science of human motion and anatomic and mechanical principles as they relate to an understanding of skillful, efficient, and purposeful

*Lab fee required.

human motion. Introduction to the cinematographic analysis.

62.254 Exercise Physiology 4 Q.H.
(Prereq. 62.251)

Study of the immediate and long-range effects of exercise upon the human body, with emphasis on the cardiovascular and respiratory systems, muscles, and metabolism; physical fitness, body composition, and selected components of motor performance-assessment techniques and training principles. Introduction to indirect, open-circuit calorimetry, and EKG monitoring.

62.255 Adapted Physical Education I 4 Q.H.
(Prereq. 62.222, 62.250, 62.253)

Survey of characteristics and attitudes pertaining to special-needs individuals, with particular emphasis on the effects of their presence on current physical activity programs. Observations of special-needs programs are included.*

62.257 Advanced Athletic Training 4 Q.H.
(Prereq. 62.256)

The advanced preparation and utilization of conditioning programs and their administration for prevention and care of injuries associated with competitive athletics.

62.259 Laboratory in Exercise Testing and Prescription 4 Q.H.
(Prereq. 62.254)

Practicum in assessment of physical work capacity, cardiac function, muscular strength, muscular endurance, flexibility, and body composition; prescription of exercise programs used to improve the above functions; volunteer work as an exercise test technician and exercise leader in a fitness class.

62.260 Measurement and Evaluation 4 Q.H.
Construction, use, selection, and interpretation of evaluative tools applicable to physical education; elementary statistical methods.

62.263 Kinesiology II 4 Q.H.
(Prereq. 62.253)

A continuation of Kinesiology I, with emphasis on the mechanical aspects of human motion. The internal and external forces acting upon a human body and the effects produced will be examined.

62.264 Electrocardiography 4 Q.H.
(Prereq. 62.254)

A study of basic and intermediate electrocardiography, including cardiac function, lead systems, rate, rhythm, axis, infarction, ischemia, hypertrophy, effects of cardiovascular drugs, and purposes and principles of exercise testing.

62.265 Adapted Physical Education II 4 Q.H.
(Prereq. 62.255)

Assessment, diagnostic, and prescriptive procedures in special-needs physical education pro-

grams. Emphasis is on modification techniques and integration of programming in accordance with legislative guidelines. Practicum experiences in special-needs settings are included.

62.267 Principles of Physical Activity for the Older Adult 4 Q.H.

Principles of physical activity and the organization of physical activity programs for the elderly in public and private agencies are studied. Research and practical applications of theory are required.

62.270 Administration of Physical Education 4 Q.H.
(Prereq. 62.209 or 62.210)

The organization and administration of programs in physical education, with emphasis on elementary and secondary school programs.

62.271 Theory of Officiating 2 Q.H.
Knowledge and skills in the basic concepts of officiating individual and team sports.

62.272 Officiating Skills 1 Q.H.
(Prereq. 62.271 or permission of instructor)
Study of the knowledge and skills necessary for a beginning official in a sport selected by the student.

62.273 Sports Officiating 2 Q.H.
Theory, practice, and techniques of officiating in such sports as basketball, baseball, soccer, ice hockey, lacrosse, and football.

62.274 Sports Officiating 2 Q.H.
Theory, practice, and techniques of officiating in such sports as basketball, volleyball, softball, soccer, field hockey, lacrosse.

62.276 Critical Teaching Skills 4 Q.H.
(Prereq. 62.216 or 62.219)

Course offers analysis of direct and indirect, verbal and nonverbal teaching methods for classroom and activity teaching, using techniques such as microteaching, peer teaching, and simulation. Techniques for measuring teacher behavior, such as interaction analysis, are studied and analyzed. A laboratory experience in an education setting is an essential activity.*

62.278 Group Dynamics II 2 Q.H.
(Prereq. 62.205)

Exposure to outdoor activities, along with involvement in Project Adventure and other outdoor pursuits, to teach various skills.

62.280 Curriculum Development 3 Q.H.
(Prereq. 62.275 or permission of instructor)

Course focuses on basic foundations of curriculum development, stressing fundamental principles and guides to curriculum organization, format, and evaluation. Course material includes experience using the taxonomies of

* Designed to satisfy partially pre-practicum requirements for teacher certification.

education objectives and survey of existing curricula and current curriculum trends.

62.281 Supervised Field Experience 12 Q.H.
(Prereq. Senior status in major or permission of instructor)

Course offers assignment in a field setting related to the student's area of concentration within the physical education curriculum, including observation and performance of professionally related skills under the guidance of a cooperating field professional and a college supervisor. To be taken by physical education majors who are not in a teacher certification program.

62.282 Supervised Student Teaching (Practicum) 12 Q.H.

Course provides a minimum of at least 300 clock hours in an approved school, with clear instructional responsibilities for at least half of the time and full teaching responsibilities for a substantial period of time under the guidance of a certified cooperating teacher and college supervisor. The assignment must be at the level of teacher certification sought (K-9 or 5-12) and include coaching and/or intramural organization and supervision, evaluation conferences, and seminars. Students can prepare themselves for Certificate No. 30 Teacher of Physical Education, as granted by the Commonwealth of Massachusetts.*

62.283 Modern Dance Composition 3 Q.H.
(Prereq. 62.12F or permission of instructor)

An analysis of dance composition, with practice in choreography for solo, duet, and trio.

62.284 Dance History and Philosophy 4 Q.H.

A survey of dance from ancient times to the present. Consideration of dance as an art form in

relation to other art forms and as an educational discipline.

62.286 Dance: Choreography and Production 4 Q.H.

Choreography for trio, quartet, and large groups based upon the projection of an idea or mood. Theory and practice in the staging of student choreography, including lighting, costuming, scenery, and makeup.

62.287 Jazz Dance Composition 3 Q.H.
(Prereq. 62.12M)

Theory and practice in the use of eurhythmics as applied to jazz movement. Progression to dance composition for jazz theatre and musical comedy.

62.289 Creative Dance I 2 Q.H.
(Prereq. 62.12F or equiv.)

Theory and practice of methods and materials in teaching creative dance to elementary school children. Examination of the aims and responsibilities of dance education at the primary level.

62.290 Creative Dance II 2 Q.H.
(Prereq. 62.12F or equiv.)

Theory and practice of methods and materials in teaching creative dance to secondary school children. Examination of the aims and responsibilities of dance education at the secondary level.

62.291, 62.292, 62.293 Special Programs 2, 3, or 4 Q.H.

(Prereq. Permission of Dept. chairperson)
The course focuses on independent investigation of physical education in an area of each student's interests. The investigation will be supervised by an appointed faculty member and will culminate in a formal written report.

Recreation and Leisure Studies

63.121 Guitar I 1 Q.H.

An introduction to using the guitar in recreation programs. Skill development includes basic chords, progressions, and strumming techniques.

63.12P Sports Leadership 2 Q.H.

The exploration of teaching techniques involved in team, dual, and individual sports. Methods, such as the part-whole and whole-part, are presented and investigated to establish relevance to each of the sports areas under study. Students are given the opportunity to develop skills in planning units and individual lessons. In addition, students are expected to apply practical experience by teaching one lesson in each of the sports areas studied.

63.12Q Survey of Aquatics 2 Q.H.

Exploration of various aquatic events that may enhance recreational swimming programs. Students are given the opportunity to develop planning, execution, and evaluation techniques for each area of study. In addition, students may attend and evaluate a planned water event. Areas of study include party events for all ages, competitive swimming and diving, synchronized swimming, water polo, and events for the atypical.

63.12T Photography 1 Q.H.

A basic study including the history of photography, types of cameras, use of black-and-white and color film; use of F-stops and shutter speeds, darkroom equipment, supplies and pro-

* Teacher certification requirements available in 106 Dockser Hall.

cedures. Field trips exploring photography techniques and darkroom experiences are included.

63.12Y Introduction to Winter Skills 1 Q.H.
Course investigates several winter sports, their origins and history, current population demands, and future trends. Various types of equipment and their use, as well as special health and safety considerations for winter sports, are discussed. Sports to be studied include cross-country skiing, snowshoeing, skating, tobogganing, and snowmobiling.

63.124 Camp Leadership 2 Q.H.
One-week resident camp experience at the Warren Center. Course subjects in the student-faculty-planned program include natural science, basic sailing and canoeing as well as campcraft skills, outdoor sports, and social recreation for special day and evening programs. Resident fee required.

63.126 Survey of Recreation Facilities 3 Q.H.
Study of fundamental management and administration concepts for a wide variety of outdoor areas and facilities such as parks, beaches, ice rinks, marinas, camps, and community centers.

63.129 School Camping 3 Q.H.
(Prereq. 63.171 or permission of instructor)
Investigation of outdoor education as it applies to school camp organization, administration, program planning, and educational significance. Each student is required to participate in a one-week supervised practical experience at a designated school camp.

63.139 Life/Career Planning 4 Q.H.
This course is designed to help students develop life/career planning skills for use in pursuit of a career in recreation and leisure studies. A variety of careers, co-op job opportunities, and lifestyles of professionals in the field are explored. Students are given the opportunity to assess their own interests, values, needs, and skills and to develop job-finding skills, including resume writing and interviewing techniques.

63.140 Basic Sailing 2 Q.H.
Instruction leading to an opportunity to qualify for Red Cross basic sailing certification. Classes are held at the Warren Center and include theory and practical experience.

63.141 Basic Canoeing 2 Q.H.
Instruction leading to an opportunity to qualify for Red Cross basic canoeing certification. Classes are held at the Warren Center and include theory and practical experience.

63.144 Tripping and Orienteering 2 Q.H.
Practical experience in the art of orienteering, including its uses in camping, backpacking, and

resident camping. Course is held at the Warren Center and includes overnight excursions. Fee charged.

63.145 Winter Sports 2 Q.H.
Five-day resident session. The course provides daily instruction in Alpine and cross-country skiing. Includes predeparture seminars. Separate fees are charged for room, board, transportation, lifts, lessons, and equipment rental.

63.146 Camp Administration 3 Q.H.
The course offers investigation of camp management guidelines including site development, health and safety, hiring and staff training, public relations, American Camping Association standards, legal regulations, organization within camps, programs, and other selected administrative aspects.

63.147 Outdoor Education for the Handicapped 3 Q.H.
Program planning and methods of conducting programs relating to adaptation of facilities and activities necessary for the physically and mentally disabled are explored through observations, participation, and direct laboratory experience.

63.148 Introduction to Recreation and Leisure 3 Q.H.
The course provides an overview of the recreation and leisure service field with emphasis on history, scope, rationale, setting, programs and services, basic trends and issues, and future considerations. The course explores the basic elements of the recreation and leisure service field as they relate to society, the leisure profession, and the individual.

63.153 Social and Psychological Impacts of Illness and Disabilities 4 Q.H.
(Prereq. 63.162)
Exploration of relevant issues related to disability such as societal understanding of disability, handicapping conditions, adjustment, social networks, and the therapeutic use of self through a mixture of lectures, group discussion, guest speakers, and films. Examination of self in the role of change agents and care providers.

63.154 Basic Rockclimbing and Rappelling 2 Q.H.*
A training program designed to introduce potential rockclimbing leaders to all necessary facets of the sport. While successful completion of the program does not qualify a student to lead rockclimbing trips, it may help students to gain a better perspective of both the necessary skills and the leadership role in rockcraft. The program consists of a weekend of practical experience and two introductory discussion sessions at Bouvé. Program areas include activities and information regarding basic climbing and rap-

*Lab fee required

elling experience, knots, safety, belaying, equipment usage and care, and leadership. The lab fee includes lodging, meals, equipment use, and instruction.

63.155 Leisure and Lifestyles 4 Q.H.

The course focuses on aspects contributing to lifestyles and the role of leisure. Specific lifestyles are examined through case studies and guest presentations. Students have the opportunity to examine the effect of leisure on their present lifestyles and future aspirations.

63.156 Foundations of Psychiatric Services in Therapeutic Recreation 4 Q.H.

(Prereq. 19.105, 63.153, or permission of the instructor)

The course focuses on orientation to the foundations of mental health and variables affecting mental illness; examination of various psychiatric disorders and treatment modalities and the role of activity therapy in the treatment of mental illness; review of contemporary trends in psychiatry that pertain to therapeutic recreation.

63.157 Therapeutic Recreation with Developmentally Disabled Persons 4 Q.H.

Course offers a review of major phases of normal growth and development for the purpose of understanding the causes and impact of developmental disabilities. Emphasizes role of play experiences in achieving sequentialized skills and concepts, practices and procedures employed in program design.

63.161 Foundation of Leadership in Leisure Service 4 Q.H.

The course offers study of the basic principles of leadership relevant to the fundamentals of leadership in leisure services. Subjects include leadership styles, motivation, task sequencing, behavioral objectives, adaptation, and evaluation.

63.162 Overview of Physical Disabilities 4 Q.H.

The course offers a study of the humanistic approach to people with physical disabilities including amputations, traumatic conditions, sensory impairments, neurological, orthopedic, and cardiovascular disorders. Rehabilitation procedures and treatment, adjunctive therapies, prosthetics, orthotics, assistive devices and techniques, and reentry into the community from the individual, familial, and societal perspectives are discussed.

63.163 Concepts of Leisure: Sociopsychological Perspectives 4 Q.H.

The course focuses on exploration of the various sociopsychological perspectives of leisure and the relations of mores, social structure, roles, values, and personality to leisure expression. Investigation of other pertinent social and environmental factors that contribute to the phenomenon of leisure is included.

63.164 Leadership and Organization of Wilderness Recreation 4 Q.H.

The course offers in-depth investigation of the leadership, organization, planning, implementation, and evaluation of outdoor pursuits. Particular emphasis is placed on multi-day experiences in remote or wilderness settings. An extended outdoor practicum in a wilderness setting is required.

63.165 Program Planning in Recreation 4 Q.H.

The course focuses on examination of program content, leadership, administration, and facilities associated with the effective delivery of leisure services under the auspices of public, private, religious, industrial, and voluntary agencies.

63.166 Arts and Crafts for Leisure 2 Q.H.

The course provides students the opportunity to discover, acquire, and adapt various craft skills such as inexpensive crafts, sculpture, painting, etc. The planning and programming of craft sessions are also covered.

63.167 Social Dance Leadership 2 Q.H.

The course offers a survey of folk, square, and ballroom dance appropriate for use with a wide range of age groups. Included are development of appreciation and understanding of the values and program potential of social dance; on-site experience and general techniques of leadership.

63.168 Budget Analysis 4 Q.H.

The course focuses on the study and use of analytical techniques that can improve budgeting decisions. Topics include cost-effectiveness and benefit-cost analysis, efficiency measures, pricing, forecasting, and present-value analysis for solution of capital and operating budget problems in the nonprofit and commercial recreation sectors.

63.169 Program Planning in Therapeutic Recreation 4 Q.H.

The course examines advanced planning of comprehensive therapeutic recreation services. Focus is on systems approach to planning for individuals and groups. Included are an intensive examination of the philosophy of therapeutic recreation; the study of the functional elements of activities, current legislation, and standards for service delivery.

63.170 Interpretation of Ecological and Social History 4 Q.H.

The course examines the employment of site visitations and problem-solving methods to investigate human interaction with and manipulation of the physical, biological, and social environment. The course provides the opportunity to acquire knowledge of ecosystem aspects which can be applied to environmental interpretation and decision-making sectors of ecosystem and recreation management.

- 63.171 Environmental Education** 4 Q.H.
The study of the philosophy and history of environmental education in political, social, and educational movements. Exploration of methods of developing, teaching, and evaluating environmental education curricula applicable to schools, camps, parks, and environmental centers.
- 63.172 Seminar on Environmental Issues and Legislation** 4 Q.H.
The course offers study of the development of attitudes toward the environmental and critical investigation of the history of the environmental movement. Investigation of current environmental issues and laws affecting our ecosystem and lifestyles through integrating theories from sociology, ecology, economics, and politics. Exploration of degrees of ecological and social constraints on future growth and definition of alternative futures.
- 63.173 Leisure and the Community School** 4 Q.H.
The course provides exploration (through class lectures, discussions, readings, and on-site visitations) of the theoretical, operational, and motivating aspects of the community school concept. An opportunity to investigate the complex role played by leisure in the community school.
- 63.174 Elements of Outdoor Recreation Planning** 4 Q.H.
The course offers exploration of the nature and significance of the outdoor recreation experience and how our natural resources can optimally meet people's needs. Focus is on the elements of outdoor recreation planning: identification, evaluation, assessment, and implementation. Relation of social groups, natural resources, and environmental concerns to outdoor recreation planning are included.
- 63.212 Leisure Counseling** 4 Q.H.
This course provides students an opportunity to develop fundamental group counseling skills through the use of specialized strategies and traditional verbal counseling techniques. Major focus is on lifestyle awareness counseling.
- 63.249 Process of Aging** 3 Q.H.
The course covers the study of phases of aging; discussion of the physical, social, and emotional changes and problems that face the aged; the study of types of services offered to senior citizens, and the sources of funds allocated to sponsor such services. The role of recreation is emphasized.
- 63.250 Group Dynamics** 3 Q.H.
The study of human behavior in groups is approached through lectures, reading, and structural group experiences. Major areas of concentration include communication, leadership, decision making, and evaluation of the group process.
- 63.257 Workshop Design** 3 Q.H.
The course provides supervised practical experience in developing, implementing, and evaluating a workshop.
- 63.260 Administration of Recreation and Parks** 4 Q.H.
The course focuses on administration procedures of tax-supported recreation and park operations. Concentration on legality commissions, area and facility design, personnel policies, and problem solving related to administration and management.
- 63.261 Commercial Recreation Management** 4 Q.H.
Course offers an examination of commercial and private sector recreation services. Case studies, workshops, and practical problems are related to managing leisure opportunities for resorts, country clubs, theme parks, tourism, sports clubs, manufacturing and merchandising, and industrial recreation.
- 63.264 Program Evaluation in Recreation** 4 Q.H.
The course examines comprehensive systems for evaluating program effectiveness as it relates to the consumer of recreation services. Major emphasis placed on developing an evaluation system for an agency of the student's choice. Case studies are drawn from the public, nonprofit, and commercial sectors.
- 63.268 Urban Recreation** 4 Q.H.
The course provides an examination of the different cultural and sociological patterns of various ethnic groups who live in an urban setting. Various recreational activities are suggested for each group. Other pertinent recreational issues common to the urban community are studied.
- 63.279 Internship Seminar** 1 Q.H.
Course offers preparation for professional field assignment in a leisure service setting. Focus is on identification and assessment of student career goals, analysis of previous volunteer and/or employment experiences, professional involvement, and facilitation of the internship placement process.
- 63.280 Internship in Recreation and Leisure Services** 16 Q.H.
Professional field assignment in leisure service settings designed to prepare students for professional career choices. Supervision by faculty, conferences with professional staff, and seminars. Ten-week internship.
- 63.285 Research Methods** 4 Q.H.
Study of basic statistics, the use of experimental and quasi-experimental design, sampling, instrumentation, data collection, and analysis as applied in recreation and leisure studies.
- 63.290 Research Applications** 4 Q.H.
The course examines the use of research methods in selected professional applications,

ranging from the ongoing research of Departmental faculty to student-originated studies.

63.291, 63.292, 63.293, 63.294 Independent Study Under the guidance and direction of a program adviser, students are given the opportunity to conduct projects related to their professional interests. Credit of one, two, three, or four quarter hours.

63.299 Senior Seminar in Contemporary Issues and Trends in Recreation and Leisure 4 Q.H.

Through extensive literature review, the course offers examination and discussion through extensive literature review of contemporary issues and trends in the field of recreation and leisure. Focus is on critical aspects of leisure services: legislation, consumer advocacy, professional development, research, and innovations for the improvement of service delivery.

Physical Therapy

64.114 Introduction to Physical Therapy 2 Q.H.

The course provides orientation to the field of physical therapy and its role in the health professions; theory and practice in applied body mechanics and basic procedures related to patient management.

64.115 Introduction to Physical Therapy 2 Q.H.

(Prereq. 10.105, 11.171, 11.173, 12.107, 18.143, and 18.142)

The course provides practice in the preparation of patients and equipment for various treatment procedures. Theory demonstration and practice in heat, light, and hydrotherapy.

64.123 Clinical Gross Anatomy 6 Q.H.*

(Prereq. 18.144 and 18.148)

The course covers the structure and function of the human body with particular emphasis on the skeletal, muscular, nervous, and cardiovascular systems. Clinical applications. Lecture and laboratory.

64.127 Physiology for Physical Therapists 4 Q.H.

(Formerly 64.125)

(Prereq. 18.144, 18.148, and 64.115)

The course covers neuromuscular, cardiovascular, and respiratory physiology applied to physical therapy.

64.130 Clinical Kinesiology 4 Q.H.*

(Prereq. 64.123 and 64.125)

The course covers musculoskeletal function with emphasis on the mechanical and physiological factors involved. Clinical applications to normal and pathological movements.

64.141 Physical Therapy I 2 Q.H.

(Prereq. 18.148, 64.115, and 18.144)

Course offers theory, demonstration, and practice in massage integrated with other treatment procedures. Case studies.

64.142 Physical Therapy II 3 Q.H.

(Prereq. 64.123, 64.125, and 64.141)

The course covers evaluation procedures: theory, demonstration, practice, and planning.

64.143 Physical Therapy III 4 Q.H.

(Prereq. 64.123, 64.125, 64.141, and 64.234)

This course covers basic therapeutic exercise: theory, demonstration, practice, and planning.

64.148 Physical Therapy V (64.256 continued) 1 Q.H.

(Prereq. 64.130, 64.142, 64.143, and 64.229)

Topics include neurodevelopmental treatment, neurophysiological theory, and clinical application of facilitation and inhibition techniques to enhance motor control as advocated by the Bobaths.

64.149 Clinical Seminar 2 Q.H.

(Prereq. 64.156 and 64.234)

Selected topics related to clinical aspects in physical therapy. Interpersonal relationships, ethics, and teaching methods.

64.156 Physical Therapy IV 3 Q.H.

(Prereq. 64.130, 64.142, 64.143, and 64.229)

Course covers theory, demonstration, and practice in prosthetics, orthotics, and advanced functional training of spinal cord injured patients.

64.167 Research for Physical Therapy 4 Q.H.

(Prereq. Satisfactory attainment in all prior professional courses)

The course covers introduction to research design, analysis of scientific and medical literature, and preparation of an independent research proposal; electromyography.

64.169 Physical Therapy VII 2 Q.H.

(Prereq. 64.142, 64.229, and 64.251)

The course covers theory, demonstration, and practice in electrical testing and treatment procedures.

64.171 Physical Therapy VI 2 Q.H.

(Prereq. 64.130, 64.142, and 64.143)

Respiratory physical therapy: theory, demonstration, and practice in the management of medical and surgical chest conditions. Introduction to respiratory mechanical equipment and cardiopulmonary resuscitation.

*Including lab.

64.173 Physical Therapy in the Health**Care System****3 Q.H.**

(Prereq. 64.149 and 64.184)

Concepts of rehabilitation and community health. Emphasis is on the role of the physical therapist as a member of the health team. Class discussion and seminar.

64.176 Administration**3 Q.H.**

(Prereq. 64.184)

Concepts in administration and management applied to physical therapy.

64.178 Physical Therapy VIII**2 Q.H.**

(Prereq. Satisfactory attainment in all prior professional courses)

Analysis and comparison of methods of physical therapy evaluation and treatment, with special emphasis on therapeutic exercise. Treatment planning for various problems, with emphasis on rationale and selection of treatment alternatives.

64.182 Psychosocial Aspects of Illness**3 Q.H.**

(Prereq. 64.149 and 64.184)

The course examines interpersonal relationships among patients, families, health professionals, and society with reference to the impact of and reaction to illness.

64.184 Supervised Clinical Education I**5 Q.H.**

(Prereq. Satisfactory attainment in all prior professional courses)

An introduction to clinical experience providing the student with opportunities to practice various skills in the evaluation and treatment of patients under supervision. Emphasis is placed on an understanding of treatment planning. Five weeks during Quarter 9 of the junior year in the Boston area.

64.194 Supervised Clinical Education II

(Prereq. Satisfactory attainment in all prior professional courses)

Advanced clinical education providing the student with further opportunities to practice various phases of physical therapy under supervision in preparation for assuming the role of a qualified physical therapist. Assignments in

Massachusetts and other states. Twelve weeks during senior year.

Required for graduation from the physical therapy program.

64.229 Clinical Medicine II**3 Q.H.**

(Prereq. 64.123, 64.125, and 64.257)

Orthopedic conditions and their medical, surgical, and physical therapy treatment.

64.234 Clinical Psychiatry**2 Q.H.**

(Prereq. 19.106; physical therapy students only)

Review of psychiatric categories, including consideration of etiology and treatment. Psychosocial variables significant in the management of patients with whom the physical therapist is concerned.

64.239 Investigative Studies**6 Q.H.**

(Prereq. Satisfactory attainment in all prior professional courses)

The course covers selected modules related to current practice in physical therapy; completion of research projects.

64.251 Neuroanatomy**4 Q.H.***

(Prereq. 64.143)

Morphology and function of the human nervous system. Abnormalities of structure and function of the nervous system. Lecture and laboratory.

64.255 Clinical Medicine III**3 Q.H.**

(Prereq. 64.229, 64.251, and 64.257)

The course focuses on pediatrics and neurology as related to conditions commonly treated by physical therapists.

64.256 Physical Therapy V**4 Q.H.**

(Prereq. 64.130, 64.142, 64.143, and 64.229)

Theoretical basis and clinical application of the neurophysiological approaches to treatment: Brunnstrom, Rood, and proprioceptive neuromuscular facilitation techniques.

64.257 Clinical Medicine I**4 Q.H.**

(Prereq. 18.144 and 18.148)

The course covers general medicine, laboratory medicine, and pathology as related to conditions commonly treated by physical therapists.

*Including lab.

School and Community Health Education

65.110 Foundations of Health Education**2 Q.H.**

Provides opportunities for learners to investigate the broad spectrum of career possibilities in community and school health education and to ascertain their potential roles in the field. Philosophy of health education, the conceptual approach, and trends in health education are considered.

65.114 Mental Health**4 Q.H.**

An investigation of mental illness and well-being as they relate to total health, with concern for the factors that influence mental and emotional behavior. Various approaches to mental health education in school programs included.

65.116 Nutrition 4 Q.H.

(Prereq. 12.102, majors only)

This course offers the student the opportunity to learn and evaluate nutrition information both as a future educator and as a consumer. The chemical, biological, and physiological basis of nutrition are explained.

65.117 Public Health 4 Q.H.

History and overview of public health agencies and the organization of services for meeting community health needs at the local, state, federal, and international levels. Focus is on today's major health problems.

65.131 Current Issues in Health 4 Q.H.

Focus is on personal health issues; topics may include mental health, human sexuality and reproduction, drug use and abuse, nutrition, communicable and chronic diseases, consumer health, and environmental concerns. Emphasis is placed on issues of concern to the participants.

65.132 Death Education 4 Q.H.

An interdisciplinary approach to the contemporary issues involved in death and dying. The course is designed to better prepare the student to: 1) assist the dying person in achieving an "appropriate" or "healthy" death; 2) understand, interact, and intervene with the suicidal individual; 3) cope with the loss of a significant other; and 4) prepare for one's own death.

Death is examined from a lifecycle approach—views of death from childhood to old age are investigated. Various value-clarifying activities and exercises will be utilized in exploring the student's attitudes and feelings toward death. In addition, the dynamics of grief, bereavement, and mourning are studied with the concept of "loss" being viewed from a "stress perspective." The potential constructive and destructive implications of bereavement on health and well-being are explored, with discussion on theory and research. Finally, the relation between stress, personality, and terminal illness and the empirical data in this area will also be examined. Overall, the goal of the course is to stimulate the student to act to attain life's priorities and values and to improve health in a Maslowian self-actualizing sense.

65.140 Longevity and Aging 4 Q.H.

Study of the biological, psychological, and sociological aspects of human aging. Consideration is given to the importance of one's current lifestyle in relation to the phenomenon of longevity and the quality of life.

65.160 Instructional Resources 2 Q.H.

Introduction to the use of audiovisual media as educational tools. Production of slide presentations, transparencies, bulletin boards, displays, etc., is included. Opportunities are provided for experiences in operating selected equipment.

65.191 Independent Study I 1 Q.H.

65.192 Independent Study II 2 Q.H.

65.193 Independent Study III 3 Q.H.

65.194 Independent Study IV 4 Q.H.

Designed to provide the student with an opportunity for concentrated planning and research. In-depth study may be carried out in a topic area of health education. Outline of proposed study must be submitted for departmental approval.

65.208 First Aid 2 Q.H.

Instructs students in principles of first aid and skill competencies necessary to care for selected injuries and to meet certain emergencies. Successful completion of the course leads to certification in first aid by the American Red Cross.

65.209 Introduction to Safety 2 Q.H.

(Prereq. 65.110)

Introduces the principles and fundamentals of safety education as they relate to people in their environment. Concerns safety as a social problem; considers major accident areas, accident causes, and liability; and analyzes possible solutions to accident problems.

65.217 Teaching Procedures/Curriculum in Health Education in School and Community 4 Q.H.

The prospective health educator is introduced to health education curriculum, techniques of planning, and pertinent methods and materials in school and community health education.

65.218 Public Health 3 Q.H.

(Prereq. Pharmacy majors only)

Principles of public health, with particular emphasis on the emerging patterns of community organization and activities in the public health field.

65.219 Evolving Patterns of Community Health Education 4 Q.H.

Principles of community health, with emphasis on contemporary local, national, and international organizations for meeting health problems; health care delivery, consumer health issues, environmental health, community resources, and the role of health education in the community.

65.220 Community Health 4 Q.H.

Focus is on today's major community health problems, with an overview of the organization of services for meeting community health needs at the local, state, federal, and international levels.

65.222 Drug Use and Abuse 4 Q.H.

The use, misuse, and abuse of drugs in our society, including prescription and nonprescription drugs, alcohol, caffeine, and nicotine, and the physiological, psychological, and sociological effects on humans are considered. A rational perspective from which to explore the interrelations among history, prevailing attitudes, environmental differences, and drug-

taking behavior is presented. Various approaches to drug education in school/community programs are discussed.

65.223 Human Sexuality and the Family 4 Q.H.
(Prereq. 50.131)

Physical, psychological, social, historical, semantic, and comparative cultural aspects of human sexuality; needs and problems at several stages of maturation, including various approaches to sex education in the school.

65.225 Communicable and Degenerative Diseases 4 Q.H.

The disease immunity process, with emphasis on prevalent communicable diseases in the United States today and their transmission; chronic diseases, cardiovascular diseases, cancer, diabetes, and other constitutional and degenerative diseases and disorders that affect the nation's health. Predominant themes are personal health attitudes and behaviors. Personal health responsibility is analyzed.

65.233 Organization and Administration of School and Community Health Education 4 Q.H.

Principles and methods of organization and administration of school and community health education programs; ethics, personnel, budget, facility management, and priorities.

65.234 Health Problems of Youth 4 Q.H.

Application of health concepts to assist youth in reaching a higher level of wellness through preventive measures. Significant physical, mental/emotional, and social health problems are identified so that they may be intelligently

dealt with by health professionals, teachers, and adults concerned about youth.

65.235 Health Counseling 4 Q.H.

The identification of physical, mental, emotional, and social health problems; remedial procedures; and counseling techniques to aid health educators to deal more intelligently with various health problems.

65.238, 65.239 Seminar (each) 2 Q.H.

(Prereq. for 65.238 is 50.141)

(Prereq. for 65.239 is 65.238)

Discussion of current problems and new developments as they relate to health education in school and in a variety of community settings. An introduction to research and scientific writing, culminating in a research project in an area of special interest, is included.

65.240 Student Teaching 12 Q.H.

(Prereq. 65.217)

Observation and practical teaching experience in public school health education programs. Supervision and evaluation by personnel, in cooperating schools and by Boston-Bouvé College of Human Development Professions faculty; seminars.

65.241 Field Experience 12 Q.H.

(Prereq. 65.217)

Observation and practical field experience in selected community health education settings. Supervision and evaluation by personnel, in cooperating schools and by Boston-Bouvé College of Human Development Professions faculty; seminars.

Pharmacy and Toxicology

71.140 Pharmaceutics I 4 Q.H.

(Prereq. 10.107, 11.175, 12.145, and 71.259)

The course focuses on the study of physicochemical theories and principles and their application to pharmaceutical systems. Topics include intermolecular forces and states of matter, thermodynamics, solutions, ionic equilibria, solubility, complexation, interfacial phenomena, rheology, and coarse dispersions.

71.141 Pharmaceutics II 5 Q.H.

(Prereq. 71.140)

The course focuses on the application of the fundamental principles of physical pharmacy to the formulation of pharmaceutical preparations. Emphasis is on pharmaceutical dosage forms, including both industrial formulation and extemporaneous compounding.

71.142 Pharmaceutics Laboratory 2 Q.H.

(Prereq. 71.141 or concurrent enrollment)

The course focuses on the application of the fundamental principles and techniques of pharmaceutics to the laboratory preparation and use of various pharmaceutical drug products.

71.183 Special Research Project

(Clinical Pharmacy)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in clinical pharmacy, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.184 Special Research Project

(Clinical Pharmacy)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in clinical pharmacy, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.185 Special Research Project

(Clinical Pharmacy)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in clinical pharmacy, wherein the student may

undertake in-depth investigation of an area of specialized interest.

71.186 Special Research Project

(Clinical Pharmacy)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in clinical pharmacy, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.193 Special Research Project

(Pharmacy Administration)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in pharmacy administration, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.194 Special Research Project

(Pharmacy Administration)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in pharmacy administration, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.195 Special Research Project

(Pharmacy Administration)

4 Q.H.

(Prereq. Permission of instructor and program director)

This is a course of directed study or research in pharmacy administration wherein the student may undertake in-depth investigation of an area of specialized interest.

71.200 Pharmacy Externship

4 Q.H.

(Prereq. Fifth-year standing)

A 520-hour (13 weeks x 40 hours/week) structured practicum in community pharmacy. The experience includes applied aspects of community pharmacy management; medication dispensing; and patient-oriented services such as prescription and non-prescription medication, consultation, and patient-profile monitoring.

71.213 Selected Topics in Clinical

Pharmacy I

4 Q.H.

(Prereq. 71.268 and permission of instructor)

Designed to help students increase their understanding of selected diseases. Pathophysiology and diagnosis of the illness, as well as drug therapy and its relation to patient compliance and education. Provides greater depth than existing clinical pharmacy courses.

71.214 Selected Topics in Clinical

Pharmacy II

4 Q.H.

(Prereq. 71.268 and permission of instructor)

This is a course designed to help increase the student's knowledge of selected disease entities. Topics will include pathophysiology and diagnosis of the illness as well as drug therapy and its relation to patient compliance and

education. It will be more in-depth than existing clinical pharmacy courses.

71.218 Caring for Patients: Psychosocial Aspects of Illness

4 Q.H.

(Prereq. One course in psychology or sociology and previous experience working in a health profession; or permission of instructor)

The course is designed to help students integrate specific technical competence in the health professions with serious concern for psychological, social, and attitudinal factors in illness and health care. Use of readings in behavioral science literature, film and videotape, case analyses, and personal reflection. Emphasis on applying knowledge and techniques of behavioral sciences to specific cases from students' clinical practice and work experience in the health professions. Examination of practitioner-patient relationships, patients' needs and responses in illness and treatment, and professional behavior in clinical settings.

71.220 Interpersonal Skills for Health

Professionals

4 Q.H.

(Prereq. One course in psychology or sociology and previous experience working in a health profession; or permission of instructor)

The course is designed to apply the skills of interpersonal communication and group process to situations encountered in various health care settings. Through video-tapes of role playing, patient simulations, and actual patient and inter-professional encounters, the student is provided with an opportunity to learn the techniques of active listening, empathy, problem solving, conflict resolution, leadership, and cooperation.

71.227 Parapharmaceuticals

2 Q.H.

Course focuses on the nature and application of various surgical devices, appliances, bandages, and hospital and sickroom supplies in patient care.

71.243 Pharmaceutical Jurisprudence

4 Q.H.

(Prereq. Permission of instructor)

The course offers a comprehensive analysis and interpretation of laws relating to the practice of pharmacy. Federal and state food and drug laws, narcotics laws, Medicare and Medicaid regulations, and state pharmacy laws are discussed.

71.244 Hospital Pharmacy Management

4 Q.H.

(Prereq. Senior standing or permission of instructor)

The factors involved in the operations and management of a hospital pharmacy.

71.245 Pharmacy Administration I

4 Q.H.

(Prereq. Permission of instructor)

The course covers socioeconomic aspects of pharmacy: the government's relation to the pharmaceutical industry, trends in contemporary practice, third-party payment plans, macroeconomic impact on the industry, and the interaction of current concepts in pharmacy.

71.249 Drug Information and Evaluation 3 Q.H.
(Prereq. Fifth-year standing or permission of instructor)

An introduction to the practice of drug information. Material covered includes the levels of practice, the availability of therapeutic reference sources, the use of abstracting and indexing systems, how to respond to drug information questions, and basic statistical data required to help understand the medical and pharmaceutical literature.

71.255 Clinical Pharmacy Clerkship 15 Q.H.
(Prereq. 71.251)

Students are assigned to a clinical site for five full days per week to observe patient response to medication and to evaluate and advise on all factors that may modify efficacy, safety, and economy of therapy. Campus seminar involves student presentations on current therapeutic topic.

71.259 Basic Pharmacy (replaces 71.260) 3 Q.H.

The course provides an introduction to the general scope of pharmacy, including calculations, basic tools, and equipment used in the practice of pharmacy. The student is also introduced to various drug products, parapharmaceuticals, and medical terminology.

71.264 Biopharmaceutics/ Pharmacokinetics 4 Q.H.
(Prereq. 71.141, 93.156, and 73.204)

Introduction to biopharmaceutics and pharmacokinetics. Emphasis is on the kinetics of drug absorption, distribution metabolism, and excretion in respect to dosage forms, drug interactions, and therapeutic response. Mathematical models for these processes are developed and applied to bioavailability data and the evaluation of drug therapy.

71.268 Clinical Pharmacotherapeutics 5 Q.H.
(Prereq. 73.265 and 73.245)

The course covers discussion of common clinical laboratory tests, major disease states, and drug therapy for these conditions.

71.269 Pharmacokinetic Principles in Drug Therapy 4 Q.H.
(Prereq. 71.264)

The course covers the monitoring, development, and modification of drug dosage regimens, and the pharmacokinetic factors influencing the selection of these regimens, for the various therapeutic categories of drugs.

71.284 Professional Practice Laboratory 1 Q.H.
(Prereq. Senior standing or permission of instructor)

Compounding and dispensing medications. Emphasis is on patient counseling techniques and monitoring for appropriateness of therapy. Prescription compounding involves screening for incompatibilities. Also includes an introduction to the preparation of intravenous solutions.

71.288 Non-Prescription Medication 4 Q.H.
(Prereq. 71.264)

A course designed to provide an overall view of the various types of "over-the-counter" medications. The directions and precautions for proper use of these preparations are discussed.

71.292 Seminar in Community Pharmacy Management 4 Q.H.
(Prereq. Permission of instructor)

A discussion course on all phases of community pharmacy operations with extensive utilization of the case method of instruction.

71.293 Pharmaceutics Special Research Project 4 Q.H.*
(Prereq. Permission of instructor(s) and program director)

A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.294 Pharmaceutics Special Research Projects (each) 4 Q.H.
(Prereq. Permission of instructor(s) and program director)

A course of directed study or research in pharmaceutics, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.295 Pharmaceutics Special Research Project 4 Q.H.*
(Prereq. Permission of instructor(s) and program director)

A course of directed study or research in pharmaceutics, wherein the student may undertake in-depth investigation of an area of specialized interest.

71.296 Community Pharmacy Management 4 Q.H.
(Prereq. Senior standing or permission of instructor)

The course focuses on the management requirements for establishing a community pharmacy. A comparative analysis of the prevailing types of organizations, locations, leases, business organization, staffing, plant layout and design, and financial factors.

71.297 Principles of Management 4 Q.H.
(Prereq. Permission of instructor)

The course covers the fundamentals of business organization with emphasis on the qualitative and legal aspects of management. This course includes an analysis of the marketing structure of the drug trade, forces of organizations, personnel management, and decision-making theory using nonqualitative data.

71.298 Financial Management 4 Q.H.
(Prereq. Permission of instructor)

The course examines the fundamentals of accounting and finance with emphasis on their

* Lab fee required

application to retailing and community pharmacy management. Accounting systems, analysis of financial statements, budgets, cash flow, taxation, and finance are covered in depth.

72.135 Anti-Infectives 5 Q.H.

(Prereq. 12.145, 18.131, and 18.132)

Course offers introduction to microbiology, microbial disease, and the chemotherapeutic agents used in their treatment; clinical applications of important current antibiotics.

72.230 Drug Analysis 5 Q.H.*

(Prereq. 12.119, 12.145)

The course offers a survey of the quantitative analytical techniques applicable to the evaluation and assay of natural and synthetic drugs and their formulations. Emphasis is on chromatographic, spectroscopic, and other instrumental methods, with selected laboratory experiments in the use of these as defined in official compendia.

72.253 Medicine Out of the Earth 4 Q.H.

(Prereq. 12.144, 12.145, 18.131, and 18.132)

This course focuses on the historical use of plants as drugs and their role in the development of modern medicinal and pharmaceutical preparations. Introduction to a variety of modern approaches to the discovery of new drugs is included, with reference to current research programs employing them. Films, slides, and demonstrations illustrate the techniques involved.

72.260 Basics of Nuclear Pharmacy 4 Q.H.

This course comprises the study of the physics, chemistry, and pharmaceutical use of radiopharmaceuticals. Methods for preparing and handling these drugs will be discussed in a practical way, as well as the rationale for their use in diagnosis and therapy.

72.261 Identification of Abuse Drugs 4 Q.H.

(Prereq. 12.171, 72.230, or equiv.)

The course provides an introduction to the chemistry, biological action, and methods of detection and assay of commonly abused drugs.

72.263 Medicinal Chemistry/ Pharmacology I 4 Q.H.

(Prereq. 18.132, 12.145, 73.202, 73.204)

Course offers an introduction to the principles of pharmacology and medicinal chemistry applied to the discovery of drugs and their therapeutic utility in man; a detailed discussion of drugs affecting the central nervous system, including therapeutic indications, adverse reactions, and mechanisms of action.

72.293 Special Research Project (Medicinal Chemistry) 4 Q.H.*

(Prereq. Permission of instructor and program director)

Courses offer directed study or research in one of the medicinal chemistry areas. Students may

undertake in-depth investigation of an area of specialized interest.

72.294 Special Research Project (Medicinal Chemistry) 4 Q.H.*

(Prereq. Permission of instructor and program director)

Course offers directed study or research in one of the medicinal chemistry areas. Students may undertake in-depth investigation of an area of specialized interest.

72.295 Special Research Project (Medicinal Chemistry) 4 Q.H.*

(Prereq. Permission of instructor and program director)

Course offers directed study or research in one of the medicinal chemistry areas. Students may undertake in-depth investigation of an area of specialized interest.

73.111 Drugs—Their Uses and Actions 4 Q.H.

Topics include background, classification, dose responses, untoward side effects, uses and commercial preparations of a broad series of drugs. (Not open to pharmacy, respiratory therapy, or nursing majors).

73.114 Basic Pharmacology 3 Q.H.

(Prereq. Permission of instructor)

This course provides students an opportunity to learn the classification mechanisms of action and uses of a broad spectrum of therapeutic agents. Dose response and untoward side effects are emphasized.

73.116 Pharmacodynamics 3 Q.H.

(Prereq. 18.148, 18.125, 18.120, 12.106, and 12.107)

This course provides introductory expositions of pharmacologic principles, with the pharmacotherapeutics of drug groups and individual drug substances of particular importance in treatment and diagnosis of disease.

73.117 Pharmacology for the Respiratory Care Practitioner 4 Q.H.

The course provides an orientation to pharmacology, including the scope of pharmacology definitions; drug standards; drug legislation; names, sources, and active constituents; and pharmaceutical preparations of drugs relating to the respiratory-care practitioner.

73.118 Poisons 4 Q.H.

(Prereq. Non-pharmacy majors)

This course presents an organized classification of chemicals (natural and synthetic) capable of potential harm to humans and their environment. Included are the effects, uses, treatments, and designs of poisons.

73.130 Toxicology Orientation 1 Q.H.

An introduction to toxicology as it relates to clinical, environmental, and regulatory concerns. Includes research principles, clinical toxicology of drugs, water and air pollution concerns. An

overview of the field for toxicology and science majors.

73.131 Laboratory Animal Science 4 Q.H.
(Prereq. 18.135, 73.204, and/or permission of instructor)

A comprehensive examination of the role of the laboratory animal in biomedical research. Includes historical and legislative aspects of animal research, basic anatomy and physiology, genetics and nutrition, physiological parameters, animal health and disease, and experimental protocols.

73.202 Anatomy-Physiology I 5 Q.H.*
(Prereq. 12.119 and 18.132)

The course covers structure and function of cells, tissues, and organs, including the muscular, immune, and nervous systems. The laboratory includes human skeletal anatomy and cat dissection. Both the lecture and laboratory sections of this course are oriented to students in the health professions.

73.204 Anatomy-Physiology II 5 Q.H.*
(Prereq. 73.202 or permission of instructor)

The course covers structure and function of the various life-supportive systems not covered in the first quarter: cardiovascular, endocrine, gastrointestinal, pulmonary systems. Laboratory is devoted to basic principles involved in understanding life systems and cell function.

73.215 Drug Interactions 4 Q.H.
(Prereq. 73.268)

The basic chemical-physical, pharmacodynamic, pharmacokinetic, physiological, and pathological factors associated with drug interactions are studied. The roles of these factors in the efficacy and safety of therapeutic drug regimens involving major pharmacological classes of drugs are discussed.

73.229 Pharmacology Laboratory I 1 Q.H.*
(Prereq. 72.263)

Drug actions are observed in intact animals. The signs and symptoms are related to mechanisms of drug action and the integration of physiological systems. A major goal is the consolidation and integration of material previously presented in texts and didactic courses.

73.230 Pharmacology Laboratory II 1 Q.H.*
(Prereq. 73.229)

Basic principles of pharmacology and pharmacokinetics are observed using diverse experimental model systems. Drug action in these model systems demonstrates how pharmacological knowledge is obtained.

73.245 Introduction to Pathology 4 Q.H.
(Prereq. 73.202 and 73.204)

The course focuses on basic concepts of pathology for the pharmacy student, with em-

phasis on disease processes and alterations of normal biochemical mechanisms.

73.247 Toxicology 4 Q.H.
(Prereq. 72.263)

The course focuses on principles of toxicology, including FDA requirements relating to new drugs, environmental and other factors affecting the toxicity of therapeutic agents, mechanisms of toxicity, and clinical applications.

73.253 Fundamental Principles of Systemic Toxicology

(Prereq. 72.263) 4 Q.H.

Course offers a presentation of the principles of toxicology with reference to mode of toxic damage at the cellular and systemic levels. The course includes a discussion of the basic concepts used in evaluation of toxicity and the basic mechanisms through which toxic drug interactions are induced.

73.254 Chemical and Analytical Toxicology 4 Q.H.
(Prereq. 72.263 and 73.253)

Course offers a presentation of the structure activity approach to toxicology of chemical classes of compounds. The methodology employed to evaluate the safety of chemicals is presented.

73.256 Toxicology Laboratory 1 Q.H.*

(Prereq. 73.253, 73.254, and a course in statistics) Principles and experimental methods in toxicology are presented. Animal handling, biochemical techniques, and morphological demonstration of toxic injury are included.

73.264 Pharmacology/Medicinal Chemistry II 6 Q.H.

(Prereq. 72.263)

Continuation of 72.263. An interdisciplinary approach to the fundamental chemical and pharmacological principles of drug action. A discussion of structure-activity relationship, absorption characteristics, metabolic fate, pharmacodynamics, and therapeutic application principally of those drugs acting at sympathetic and neuroeffector junctional sites.

73.265 Pharmacology/Medicinal Chemistry III 6 Q.H.

(Prereq. 73.264)

A continuation of 73.264 with special emphasis on drugs affecting the hematopoietic systems, the kidneys, and the endocrine and reproductive systems.

73.293 Special Research Project (each) 4 Q.H.*

(Pharmacology) (Prereq. Permission of instructor and program director)

This is a course of directed study or research in pharmacology/toxicology wherein the student may undertake in-depth investigation of an area of specialized interest.

*Lab fee required.

73.294 Special Research Project**(Pharmacology)****4 Q.H.*****(Prereq.** Permission of instructor and program director)

This is a course of directed study or research in pharmacology/toxicology wherein the student may undertake in-depth investigation of an area of specialized interest.

*Lab fee required.

73.295 Special Research Project**(Pharmacology)****4 Q.H.*****(Prereq.** Permission of instructor and program director)

This is a course of directed study or research in pharmacology/toxicology wherein the student may undertake in-depth investigation of an area of specialized interest.

Nursing

80.207 Common Problems II**7 Q.H.****(Prereq.** 80.221)

The nursing process is continued and implemented in more complex situations. Assessment of client/patient status and nursing interventions are centered on individuals with pathophysiological and psychological disturbances. Major content areas addressed are: adaptation to inflammations, immunity, stresses of pre- and post-operative experiences, and metabolic responses related to alteration in health status. The effects of the client/patients' altered status on family members are explored. Students are introduced to drug therapy and begin administration of medications. Under faculty guidance, students develop a teaching plan and nursing care analysis for selected clients. Learning experiences are planned for students to provide for continuity of patient care through collaboration with clients, health team members, and appropriate community agencies.

80.209 Transition**9 Q.H.****(Prereq.** 12.106-107, 18.141-142, 18.143-144, 18.148, 19.105-106, 18.120)

The first nursing course for Registered Nurse students in the Baccalaureate Degree program introduces the purposes and objectives of this program and the philosophy of baccalaureate education. It also broadens students' perspectives of professional nursing and provides opportunities to complement and validate through guided and independent study students' knowledge of roles and role conflicts, the communication process, group dynamics, and the nursing process, specifically with those patients experiencing the stresses of aging, chronic and long-term illness, and death. Additionally the course provides opportunities to understand human nutritional needs with specific emphasis on the aged and chronically ill individual.

80.217 Nursing**4 Q.H.**

The first course in nursing introduces the student to concepts of health, the health care delivery system, professional nursing, roles in professional nursing, the scientific method of inquiry, and communications and group process. The course is designed to familiarize the student with the theories and principles of nursing and related content in the sciences and humanities. A variety of societal and environmental factors that affect the health care system in general and nursing practice in particular will be examined.

80.218 Nursing II**4 Q.H.****(Prereq.** 80.217)

The second course in nursing introduces the student to the leadership role in group process, basic human needs, and the identification of personal and professional goals. The course continues with the scientific method of inquiry and enables the implementation of communications. The course is designed to allow the student to recognize and interpret his/her own health behavior patterns. By participating in small groups, the student implements the responsibilities of a group member and recognizes the leadership role. The student will develop an understanding of the consumer role in the health care delivery system. By using a problem-solving approach in analyzing and evaluating situations, the student is able to develop a self-assessment and establish his/her own personal and professional goals.

80.219 Human Nutrition**4 Q.H.**

The study of the science of nutrition provides the student the opportunity to plan and select a nutritionally adequate and prudent diet; recognize and combat food and nutrition misinformation; utilize objectivity when working with individuals to meet their nutritional needs; and recog-

nize the importance of nutrition and its relation to health. The course will examine the physiological functions of the major nutrients and food sources, as well as common areas of consumer concern about nutrition.

80.220 Nursing 6 Q.H.
(Prereq. 80.217, 80.218, 80.219, 12.106, 12.107, 18.141, 18.142, 18.148)

This is the first nursing course with a clinical practicum. Students will implement the nursing process using Maslow's motivational theory for clients requiring assistance in meeting selected basic needs. Knowledge and skill in interviewing, health-team communication, and professional role are further developed.

80.221 Nursing 6 Q.H.
(Prereq. 80.220, 18.143, and 18.120)

Students in the second nursing course with a clinical practicum will continue to implement the nursing process using Maslow's motivational theory for clients requiring assistance in meeting selected basic needs. Learning experiences are planned for the student to gain knowledge and skill in patient education and health-team collaboration. Additional opportunity is provided for the student to further develop the professional role and interpersonal relationship skills.

81.201 Medical-Surgical Nursing 9 Q.H.
(Prereq. 80.207, 83.201, 73.116; 80.209—RNs only)

Focus is placed on the effects of episodes of acute illness on individuals, families, and society. Alterations and adaptations in physiology—characteristic of acute episodes of illness—and the nurse's role in intervention are discussed. Content also includes discussion of the impact of illness on patterns of living, needs for health teaching, and continuity of care. Guided clinical experiences are planned, with emphasis on the use of the nursing process and the development of those skills necessary to plan and implement care for the adult who is in an acute care setting.

82.201 Maternal and Child Nursing 9 Q.H.
(Prereq. 19.141, 73.116, and 80.207 or 80.209)

The focus of this course is on the application of the nursing process in maintaining optimal

health for child-bearing and child-rearing families from various cultural and social backgrounds. The student will examine individuals at selected developmental stages. Opportunity is provided for students to apply the nursing process in client-care settings and to assist families in coping with stresses that interfere with health. Learning experiences provided assist the student in furthering personal and professional development.

83.202 Psychiatric/Mental Health Nursing 7 Q.H.
(Prereq. 80.207 or 80.209)

This course is designed to help students develop knowledge of mental illness, understanding of the dynamics of human behavior, and skill in working with individuals and groups of patients in the prevention of mental illness and the promotion of mental health.

84.201 Community Health Nursing 9 Q.H.
(Prereq. 81.201, 82.201, 19.142, 20.100)

This course provides an opportunity for students to increase their understanding of the variety of ways in which families, groups, and communities organize to meet the health and welfare needs of their members. Particular attention is given to the role of the nurse in planning with individuals, families, groups, and community agencies to meet recognized needs. Themes occurring throughout the course include political implications of health care delivery and current research that affects family and group health and community nursing. Value clarification and cultural experience of nurse and client are also explored. Laboratory experience involves work with individuals, families, and communities.

85.201 Contemporary Nursing 9 Q.H.
(Prereq. 81.201, 82.201, and 20.100)

This senior-year nursing course includes lectures and seminars, with student participation in selection of learning experiences. Course varies to reflect current trends and issues in nursing and health care delivery. Students have the opportunity to demonstrate self-direction by defining their objectives for learning experiences, pursuing an area of nursing in which they are particularly interested, utilizing basic principles of research, and evaluating their own performance.

Health Professions

General Courses

86.102 Hospital Law 2 Q.H.
This course offers an analysis of the legal principles relating to medical and paramedical practice within a hospital environment. The common law and statutory rights of the hospital, practitioner, and patient are discussed.

86.103 Basic Medical Terminology 2 Q.H.
This course provides a study of the language of medicine and health care. Emphasis is on disease, procedures, and symptomatic terms and their definitions, word construction, analysis, and application. The student is provided an

opportunity to acquire working knowledge of medical terminology.

86.107 Medical Terminology 4 Q.H.

The course offers a study of the language of medicine, including prefixes, suffixes, roots, abbreviations, and disease, operative, and drug terms. Also included are terms related to all area specialties. The terms are studied as they relate to a specific system of the body.

86.112 Foundations of Medical Science I 3 Q.H.

The course covers major disease problems in our society and modes of treatment. Included are discussion of organized care; diagnosis and treatment; consideration of reproduction, birth, and pediatrics.

86.113 Foundations of Medical Science II 3 Q.H.
(Prereq. 86.112)

A continuation of 86.112, covering heart, cancer, stroke, blood and lymphatic diseases, accidents, and musculoskeletal, respiratory, and gastrointestinal diseases.

86.160 Introduction to Data Processing for the Health Services

4 Q.H.

This is an introductory course designed to introduce the student to the basic concepts of electronic data processing. Topics considered include input, output, storage, computation, and controls. The basic history of automation is reviewed and the concept of computer language is introduced utilizing FORTRAN. Simple problems are completed on an individual and group basis.

87.135 Professional Dynamics in the Health Care Delivery System

4 Q.H.

An examination of where health care is delivered, how it is financed, and who delivers it. Roles, responsibilities, academic preparation, and competencies of health practitioners are examined. Introduction to the humanistic dimensions of health professional education and practice, and orientation to professional organizations and professionalism are included.

Medical Laboratory Science

The Medical Laboratory professional courses are taught by University faculty, together with supportive clinical faculty.

87.100 Laboratory Medicine-Orientation 1 Q.H.

The course focuses on the history and development of the medical laboratory technologies and pathology.

87.102 Basic Medical Laboratory

Hematology

2 Q.H.

(Prereq. 87.151 or 87.161)

Principles and procedures of basic medical laboratory hematology, including basic hemostasis, are covered.

87.103 Basic Medical Laboratory

Immunohematology

2 Q.H.*

(Prereq. 87.132)

Basic principles in immunohematology and related techniques, with particular emphasis on those procedures used in blood banking, are covered.

87.104 Basic Medical Laboratory Science

Clinical Microbiology

4 Q.H.*

(Prereq. 18.132, 12.104 or 12.119)

Basic principles and techniques of organism isolation, cultivation, and identification from clinical specimens are covered. Elementary serologic procedures will be discussed.

87.105 Basic Medical Laboratory Chemistry and Instrumentation 4 Q.H.*

(Prereq. 12.171 and 87.150 or 87.160)

Principles, procedures, and techniques of basic clinical chemistry and instrumentation.

87.106 Basic Electronics and Medical Laboratory Science Instrumentation 1 Q.H.

(Prereq. 87.155, 11.171 or concurrently)

The course covers electricity, electronics, and electronic components with application to medical laboratory instruments.

87.109 Foundations of Clinical Laboratory Science 4 Q.H.

(Prereq. Admission to Physician Assistant Program)

Basic laboratory methods employed in primary care, including urinalysis, gram staining, hematocrit, hemoglobin, sedimentation rate, white cell count, and differential.

87.113 Basic MLS Clinical Immunology 3 Q.H.*

Topics include basic principles of immunology with laboratory emphasis on immunodiagnostic techniques currently used in clinical laboratory practice.

87.116 Medical Mycology

3 Q.H.*

(Prereq. 87.104 or 87.154)

Laboratory identification of clinically significant fungi with a discussion of modes and types of infections.

87.135 Professional Dynamics in the Health Care Delivery System

4 Q.H.

An examination of the evolution of the health care delivery system with emphasis on current aspects of how health care is delivered, how it is

*Lab fee required.

financed, where it is delivered, and who delivers it. Present and future influences in health will be discussed. Introduction to unique and collective health professional roles and responsibilities, humanistic/behavioral dimensions of health care, professional organizations, and professionalism.

87.141 MLT Applied Study in Clinical

Microbiology

2 Q.H.

(Prereq. 8M.100, 87.150, 87.151, 87.152, 87.153, 87.154, 87.155, and admission to AD-MLT Clinical Program).

Clinical practicum in microbiology at a Northeastern University-affiliated hospital providing AD-MLT-level instruction.

87.142 MLT Applied Study in Hematology

2 Q.H.

(Prereq. 87.100, 87.150, 87.151, 87.152, 87.153, 87.154, 87.155, and admission to AD-MLY Clinical Program)

Clinical practicum in hematology and coagulation at a Northeastern University-affiliated hospital providing AD-MLT-level instruction.

87.143 MLT Applied Study in Blood

Banking

2 Q.H.

(Prereq. 87.100, 87.150, 87.151, 87.152, 87.153, 87.154, 87.155, and admission to AD-MLT Clinical Program)

Clinical practicum in blood banking at a Northeastern University-affiliated hospital providing AD-MLT-level instruction.

87.145 MLT Applied Study in Clinical

Chemistry

2 Q.H.

(Prereq. 87.100, 87.150, 87.151, 87.152, 87.153, 87.154, 87.155, and admission to AD-MLT Clinical Program)

Clinical practicum in clinical chemistry and urinalysis at a Northeastern University-affiliated hospital providing AD-MLT-level instruction.

87.150 Basic Medical Laboratory

Science I

3 Q.H.*

(Prereq. 18.132 and 12.104, or 12.119)

Introductory course in basic medical laboratory science covers principles and theories of renal physiology, with laboratory emphasis on techniques for chemical and microscopic detection of normal and abnormal constituents.

87.151 Basic MLS Hematology

3 Q.H.

(Prereq. 18.132 and 12.104 or 12.119)

This introductory course in basis hematology procedures and principles covers hemoglobin, hematocrit, white and red blood cell counts, and white cell differentiation.

87.152 Basic MLS Hematology II

3 Q.H.

(Prereq. 87.151 or 87.161)

The course covers principles and procedures of hematology, with emphasis on hematologic cell

maturation and morphology and basic hemostasis.

87.153 Basic MLS Immunochemistry

3 Q.H.*

(Prereq. 18.132)

The course covers basic principles in immunochemistry, with specific application to the A, B, O, and Rh blood group systems, antibody detection, and crossmatch design. Basic blood bank techniques to include blood typing and crossmatching.

87.154 Basic MLS Clinical Microbiology

6 Q.H.*

(Prereq. 12.104 or 12.119, and 18.132)

The course focuses on basic principles and techniques of organism isolation, cultivation, and identification from clinical specimens. Elementary serologic procedures are discussed.

87.155 Basic MLS Clinical Chemistry and

Instrumentation

5 Q.H.*

(Prereq. 87.150 or 87.160, 12.171)

The course covers principles of clinical chemistry with application to procedures and techniques. Laboratory emphasis on instrumental analysis of specific clinical chemical specimens.

87.160 Basic Medical Laboratory Science

2 Q.H.

(Prereq. 12.104 or 12.119 and 18.132)

Introductory course in basic medical laboratory science. Principles and theories of renal physiology with laboratory emphasis on techniques for chemical and microscopic detection of normal and abnormal urinary tract constituents.

87.161 Basic MLS Hematology I

2 Q.H.

(Prereq. 12.104 or 12.119 and 18.132)

Introductory course in basic hematology procedures and principles: hemoglobin, hematocrit, white and red blood cell counts, and white cell differentiation.

87.166 Hematology Applied Study

4 Q.H.

(Prereq. Acceptance to MT Clinical Program)

Clinical practicum in applied hematology at an affiliated hospital Medical Technology Program, providing eligibility for MT(ASCP), CLS(NCA) certification.

87.167 Immunochemistry Applied Study

3 Q.H.

(Prereq. Acceptance to MT Clinical Program)

Clinical practicum in applied immunochemistry at an affiliated hospital medical technology program, providing eligibility for MT(ASCP), CLS(NCA) certification.

87.168 Clinical Microbiology Applied

Study

7 Q.H.

(Prereq. Acceptance to MT Clinical Program)

Clinical practicum in applied microbiology at an affiliated hospital Medical Technology Program, providing eligibility for MT(ASCP), CLS(NCA) certification.

*Lab fee required.

87.169 Clinical Chemistry Applied Study 7 Q.H.
(Prereq. Acceptance to MT Clinical Program)
Clinical practicum in applied clinical chemistry at an affiliated hospital medical technology program, providing eligibility for MT(ASCP), CLS(NCA) certification.

87.180 MLT Seminar I 2 Q.H.
(Prereq. 87.100, 87.150, 87.151, 87.152, 87.153, 87.154, 87.155, and admission to AD-MLT Clinical Program)

The course offers a basic introduction to correlation of laboratory findings in hematology, blood banking, microbiology, and clinical chemistry, with appropriate referrals of laboratory information in working situation. Basic use of quality control.

87.181 MLT Seminar II 2 Q.H.
(Prereq. Acceptance to MLT Program)
Clinical practicum in applied urinalysis, parasitology and mycology at an affiliated hospital providing MLT(ASCP) and CLT(NCA) level instruction.

87.190 Undergraduate Research 2 Q.H.
(Prereq. Special permission)
The course examines special problems in laboratory medicine involving individual research under the direction of a faculty member.

87.206 Medical Parasitology 3 Q.H.
(Prereq. 87.154)
Laboratory identification of significant human parasites. Life cycles related to mode of infestation, effect on man, and diagnostic form.

87.211 Hemostasis 2 Q.H.*
(Prereq. 87.152 or permission of instructor)
(Lecture/laboratory course in advanced hemostatic techniques. Theory and methodology will be stressed, along with interpretation of laboratory results.

87.213 Immunohematology 2 Q.H.*
(Prereq. 87.103 and 87.153)
This course offers advanced studies in antigen-antibody detection and problem solving through immunohematological tests. Discussion of related hematologic disorders and the medical/legal aspects of blood banking is included.

87.221 Medical Laboratory Management 2 Q.H.
(Prereq. Completion of clinical program)
The course offers a survey of factors that relate to effective laboratory administration: hospital organizational structure, principles of management and supervision, cost accounting, purchasing, inspection guidelines, legal responsibilities, and personnel relations.

87.222 Histochemistry 2 Q.H.*
(Prereq. 87.252)
The histochemistry of hemic cells and tech-

niques used in diagnosis of hematological disorders are covered.

87.224 Advanced Microbiology II 2 Q.H.
(Prereq. 87.154 or permission of instructor)
Topics include host and microbial interactions in disease produced by viral, rickettsial, chlamydial, mycoplasma, mycobacteria, and actinomyces, with discussion of disease states and laboratory diagnostic procedures.

87.225 Advanced Clinical Chemistry II 2 Q.H.
(Prereq. 87.155 or permission of instructor)
Course includes current methodologies and instrumentation used in clinical chemistry to evaluate hormonal conditions and drug level monitoring.

87.226 Medical Laboratory Science Education 2 Q.H.
(Prereq. Completion of clinical program)
The course offers a survey of current topics in medical laboratory science education: developing objectives, methods of evaluation and certification, clinical instruction and evaluation, medical laboratory science curricula, and use of media and other methods of instruction.

87.232 Hematology II 3 Q.H.
(Prereq. 87.152 or permission of instructor)
Topics include physiology of blood cells and bone marrow with a review of physiology of blood hemopoiesis; discussions of hematologic results as they relate to normal, anemic, and leukemic conditions.

87.234 Advanced Microbiology III 2 Q.H.
(Prereq. 87.154 or permission of instructor)
Course covers host and microbial interactions in gastrointestinal, genitourinary, and respiratory tract infections; discussion of disease states and laboratory diagnostic procedures.

87.235 Advanced Clinical Chemistry III 2 Q.H.
(Prereq. 87.155 or permission of instructor)
Course includes metabolism of and procedures for nucleic acids, amino acids, proteins, lipids, and carbohydrates.

87.242 Hematology IV — Hemostasis 2 Q.H.
(Prereq. 87.152 or permission of instructor)
Advanced studies in hemostasis with emphasis on factor identification and problem solving of hemostatic problems.

87.244 Advanced Microbiology IV 2 Q.H.
(Prereq. 87.154 or permission of instructor)
Topics include host and microbial interactions in closed-space infections and in disease produced by staphylococci and anaerobic organisms. Methods for antibiotic susceptibility testing and principles of infectious disease control are also included.

87.245 Clinical Chemistry IV 2 Q.H.
(Prereq. 87.155 or 87.105 or permission of instructor)
Course includes a discussion of laboratory procedures used to evaluate acid-base balance,

*Lab fee required.

hepatic, renal, and gastrointestinal systems as well as vitamin and trace-metal blood levels.

87.250 Communications in the Health

Sciences 4 Q.H.
(Prereq. 87.152, 87.153, 87.154, and 87.155)

The course examines communications in the medical scientific community, including journal articles, resource material, abstracts, and health-related interpersonal communications.

87.253 Immunohematology 2 Q.H. (Prereq. 87.153)

This course offers blood group systems, antibody identification, and advanced immuno-

hematologic principles and procedures. Case studies will be presented.

87.280 MLS Special Topics 2 Q.H. (Prereq. 87.150 through 87.155)

The course offers a comprehensive examination of one or more current topics in the clinical laboratory.

87.281 MLS Senior Seminar 2 Q.H. The course provides a review of current undergraduate medical laboratory science topics.

Health Record Administration

86.151 Health Record Science I 4 Q.H. (Prereq. Two years of arts and sciences)

The course offers introduction to health records; history of the medical record and medical record forms. Included are a study of professional medical record administrators and their relation to the health facility, medical staff, and committees in the hospital. Quantitative analysis of medical records.

86.152 Health Record Science II 4 Q.H. (Prereq. 86.151)

This course covers the numbering, filing, security, and preservation of medical records; principles of law related to patient care and medical records; emphasis on the rules of privileged communications and the release of information to agencies.

86.153 Health Record Science III 4 Q.H. (Prereq. 86.152)

The course examines basic principles of compiling statistics for hospital and other health institutions. Topics include the preparation of the daily census and discharge analysis; monthly, annual, and special reports; birth and death certificates; principles of standardized nomenclature of diseases and operations and ICD-9-CM; and study of other indexes used in medical records departments.

86.154 Advanced Health Record Science IV 4 Q.H. (Prereq. 86.153)

This course covers advanced aspects of health/medical record science. Special focus is on the management of record systems in ambulatory, long-term, home care, and psychiatric settings.

86.157 Seminar in Health Records 2 Q.H. (Prereq. Senior status)

Case study and discussion are used to integrate the discrete skills and knowledge of the professional curriculum into a meaningful whole by analysis of real and hypothetical problems. Coordination between the seminar and applied medical record science is emphasized.

86.158 Orientation to Medical Records I 1 Q.H. This introductory seminar focuses on the issues, activities, and opportunities in the medical record profession.

86.159 Orientation to Medical Records II 1 Q.H. Continuation of seminar that introduces the medical record profession. Focuses on the tools utilized by the medical record professional.

86.161 Quality Assurance 4 Q.H. (Prereq. 86.153, 86.154; 86.107 or permission of instructor)

This course is designed to provide the student with the opportunity to gain knowledge of the issues and problems involved in designing, implementing, and maintaining quality assurance programs for health-care facilities. An opportunity will also be provided for the student to gain the technical skills necessary to carry out all aspects of the audit process, emphasizing the professional's role as facilitator to physicians and other professional staff.

86.162 Management Principles in Health Care 4 Q.H.

This course is an introduction to basic management principles. It is designed so that the hospital (or health-care facility) can provide the major source of example and case study, giving students an opportunity to synthesize abstract principles with practical application.

86.183 Concepts and Application of Work Design 4 Q.H.

(Prereq. 86.162)

This course is designed as an introduction to systems analysis, its concepts, and techniques. Special application to health record management is stressed throughout the course.

86.164 Special Topics I 2 Q.H.

The course provides specialized study in medical records.

86.165 Special Topics II 2 Q.H.

The course provides specialized study in medical records.

86.166 Applied Health Statistics 4 Q.H.

(Prereq. Basic statistics course)

Designed to provide the health record student with the opportunity to learn to apply basic statistical techniques to the gathering, analysis, and interpretation of health care and medical record data, as well as the effective use of these tools in such areas as department management and research studies. Agencies involved in collecting statistical data will be reviewed, with the types and sources of information they require; the relation of statistics, epidemiology, and medical records will also be considered.

86.167 The Health Record Professional: Issues and Problems 2 Q.H.

(Prereq. Senior status)

This course provides the senior health record student with information on a range of topics that are germane to his/her professional role but that may not have been included in other professional courses.

86.168 Medical Computer Applications 4 Q.H.

(Prereq. EDP Course I)

The course covers utilization of electronic data processing in health care. Overview of current activities and their impact on future trends in health record management information will be discussed. The role of the RRA as an information specialist will be considered.

86.169 Independent Study 4 Q.H.

(Prereq. Permission of instructor)

This independent study project is designed to give students an opportunity to explore in depth a subject relevant to their interests. It is designed to give them the opportunity to study a problem, present a proposal, carry out a study or a course of action, and prepare both written and oral presentations of their activities.

86.173 Clinical Seminar 2 Q.H.

Designed to integrate the didactic and the clinical experience at an early stage, the course provides a formal means by which students can share clinical developments with each other. It is designed to give them an opportunity to improve their competency in specific areas of medical record practice

86.260 Applied Health Records Directed Practice I 3 Q.H.

(Prereq. 86.151)

Clinical practicum in medical record science in the general hospital.

86.261 Applied Health Records Directed Practice II 1 Q.H.

(Prereq. 86.260)

Clinical practicum in medical records science in specialized health settings.

86.264 Applied Health Records Science III 4 Q.H.

Clinical practicum in health/medical records management in the health-care facility.

86.265 Organization and Management of Medical Record Department I 4 Q.H.

This course focuses on the medical record department within the health care setting. Lines of responsibility and authority, medical staff and administrative organization, hospital department functions and organization are examined, as are fundamental principles and successful practices of office organization. An opportunity is provided for the student to develop the technical skills necessary to develop organization charts, policies, job descriptions, and job procedures.

86.266 Organization and Management of Medical Record Department II 4 Q.H.

(Prereq. 86.265)

This course focuses on the medical record department within the health care setting. Budget and cost control mechanisms, organized labor and collective bargaining, office environment and layout, and the impact of state and federal regulations on medical record practices are examined. An opportunity is provided for the student to develop the technical skills necessary to plan and analyze budgets, to plan and design office layouts, and to evaluate the impact of regulations on particular medical record applications.

86.267 Organization and Management of Medical Record Department III 4 Q.H.

(Prereq. 86.266)

This course focuses on the medical record department within the health care setting. Orientation programs; training programs; in-service education; interviewing, hiring, counseling, motivating, and disciplining employees; and communication skills are examined. An opportunity is provided for the student to develop an orientation and training program, an in-service presentation. Role-playing sessions and case studies are used to develop skill in interviewing, hiring, counseling, disciplining, and motivating employees. Emphasis is placed on verbal skills.

86.268 Applied Health Records Directed Practice II 2 Q.H.

(Prereq. 86.260)

Clinical practicum in medical record science in specialized health settings

Respiratory Therapy

86.190 Introduction to Patient Care 4 Q.H.

This course is designed to provide an opportunity for the student to gain knowledge and understanding of basic patient-care skills, including moving and positioning of patients, infection control, basic observation and assessment skills, and familiarity with the techniques of cardiopulmonary resuscitation. An opportunity will also be provided for the development of the student's interpersonal and communication skills.

86.191 Introduction to Respiratory Care 4 Q.H. (Prereq. 86.221 and pharmacology concurrently)

This course is basic to all other professional respiratory therapy courses. Focus is on the theory and application of medical gas administration and humidity/aerosol therapy.

86.195 Cardiopulmonary Laboratory Techniques 4 Q.H.

(Prereq. 86.227 and permission of instructor)

This course is designed to provide the student with an opportunity to gain knowledge and background in the principles, theory, and procedures encountered in a clinical cardiopulmonary laboratory. Focus will be placed on the physiological foundations of cardiopulmonary testing.

86.201 Professional Practice Laboratory I 1 Q.H.*

(Prereq. 86.221 concurrently)

This lab is designed to provide practice in basic care skills through laboratory exercises and simulation of patient-care situations.

86.202 Professional Practice Laboratory II 1 Q.H.*

(Prereq. 86.201, 86.222 concurrently)

The lab is designed to provide students with hands-on experience in working with respiratory therapy equipment. Simulated patient-management problems will be set up in the lab to provide problem-solving experience.

86.203 Professional Practice Laboratory III 1 Q.H.*

(Prereq. 86.202, 86.233 concurrently)

The lab is designed to provide students with hands-on experience with respiratory therapy procedures. Simulated patient-management problems will be set up in the lab to provide problem-solving experience.

86.204 Professional Practice Laboratory IV 1 Q.H.*

(Prereq. 86.203, 86.234 concurrently)
The lab is designed to provide students with an opportunity to acquire experience in working with respiratory therapy life support equipment. Simulated critical care problems will be set up in the lab to provide problem-solving experience.

86.205 Cardiopulmonary Laboratory Practice 1 Q.H.*

(Prereq. 86.195 concurrently)

This course is designed as the laboratory portion of Cardiopulmonary Laboratory Technology. Focus is placed on the techniques of pulmonary functions testing, blood gas analysis, and cardiovascular testing commonly done in the clinical setting.

86.211 Respiratory Therapy Seminar I 1 Q.H.

This is a survey course designed to introduce the beginning respiratory therapy student to the role of respiratory therapists in health-care delivery.

86.212 Respiratory Therapy Seminar II 1 Q.H.

This is a course designed to introduce the beginning student to therapeutic modalities of respiratory care.

86.213 Respiratory Therapy Seminar III 1 Q.H.

Continuation of 86.212, including introduction to life-support systems.

86.214 Clinical Seminar I 1 Q.H.

(Prereq. 86.228 concurrently)

The seminar is designed to discuss clinical topics and respiratory-care problems encountered during clinical practice in the hospitals.

86.215 Clinical Seminar II 1 Q.H.

(Prereq. 86.229 concurrently)

The seminar is designed to discuss clinical topics and critical care problems encountered during clinical practice in the hospitals.

86.216 Advanced Respiratory Therapy Seminar I 1 Q.H.

(Prereq. 86.271 concurrently)

This course is designed to complement 86.272, Perfusion Technology. Discussion of current clinical problems related to life-support systems will emphasize problems encountered in the hospital.

86.217 Advanced Clinical Seminar II 1 Q.H.

(Prereq. 86.272 concurrently)

This course is designed to complement a professional elective taken concurrently. Discussion of current clinical problems and research related to life-support systems will emphasize problems encountered in the hospital.

86.218 Advanced Clinical Seminar III 1 Q.H.

(Prereq. 86.279 concurrently)

Course is designed to complement 86.287, Practicum in Critical Care. Discussion of current clinical problems and research related to critical-care problems is emphasized.

*Lab fee required.

86.218 Advanced Clinical Seminar IV 1 Q.H.
(Prereq. 86.280 concurrently)
Continuation of 86.218. Complements 86.287,
Practicum in Critical Care.

86.233 Respiratory Care for the Medical and Surgical Patient 4 Q.H.
(Prereq. 86.191)

This course is a continuation of the introduction to respiratory therapy. It is designed as the didactic portion of beginning clinical experience on noncritical patients. Focus is placed on respiratory-care problems following major surgery and those problems related to medical patients.

86.234 Respiratory Care for the Critical Patient 4 Q.H.
(Prereq. 86.233)

The course is the last in a sequence of three directly related to the theory of respiratory therapy procedures. It is designed as the didactic portion of clinical experience on critical patients. Focus is placed on respiratory-care problems encountered with patients in intensive care units.

86.226 Cardiopulmonary Physiology 4 Q.H.
(Prereq. Satisfactory completion of the first-year courses)

The course is designed to provide a detailed introduction to the structure and function of the cardiopulmonary systems. The material presented will emphasize clinical relevance and application in preparation for the basic courses in the clinical sciences.

86.227 Cardiopulmonary Disease 4 Q.H.
(Prereq. 86.226)

This course is designed to provide a detailed introduction to the clinical diagnostic procedures employed in evaluating cardiopulmonary patients and description of the etiology, pathophysiology, diagnosis, and treatment of major cardiopulmonary diseases.

86.228 Clinical Practice I 6 Q.H.
(Prereq. 86.191 completed and 86.233 concurrently)

This is the first course designed to provide clinical experience in hospitals. Focus is on respiratory care for noncritical patients. Emphasis is placed on infection control, medical gas administration, humidification of medical gases, aerosol therapy, chest physiotherapy, deep breathing treatments, and the administration of aerosol medications.

86.229 Clinical Practice II 6 Q.H.
(Prereq. 86.233 completed and 86.234 concurrently)

The course is designed to provide clinical experience in hospitals. Emphasis is placed on respiratory care for critical patients. Advanced respiratory care topics such as airway care, mechanical ventilation, and positive and expiratory pressure are reviewed.

86.271 Advanced Life Support Systems I 4 Q.H.
(Prereq. 86.234, 86.195)

Designed to introduce students to selected techniques of advanced life support applied to the critically ill patient.

86.272 Perfusion Technology 4 Q.H.
(Prereq. 86.271)

Designed to introduce students specializing in perfusion technology to the theory, principles and concepts of cardiovascular perfusion.

86.274 Advanced Clinical Physiology 4 Q.H.
(Prereq. 73.204 and permission of instructor)

This lecture course is designed to enrich the respiratory therapy students' program by providing them with an opportunity for an in-depth exposure to medical physiology, based on the concept of the homeostatis state and its application to the clinical setting.

86.276 Neonatal Respiratory Care 4 Q.H.
(Prereq. 86.274)

The course is designed to provide the student with an understanding of the methods and techniques of respiratory therapy for neonatal patients. Emphasis is placed on mechanical ventilation, newborn care, and the respiratory distress syndrome.

86.277 Directed Independent Study I 2 Q.H.
(Prereq. 86.287 concurrently)

This is a course of directed study in a student's major wherein in-depth investigation of a special interest area is undertaken.

86.278 Respiratory Care for the Neonatal Patient 4 Q.H.
(Prereq. 86.274)

The course is designed to provide the student with an opportunity to understand the methods and techniques of respiratory therapy for neonatal patients. Emphasis is placed on mechanical ventilation, newborn care, and the respiratory distress syndrome.

86.281 Introduction to Perinatal/Pediatric Respiratory Care 2 Q.H.
(Prereq. 86.234)

This course is designed to provide the student with the opportunity to acquire knowledge and understanding of human cardiopulmonary development from the time of conception through childhood years. Normal as well as abnormal manifestations of pregnancy, labor, and the process of delivering are also emphasized. Methods and techniques of assessment and delivery of respiratory care will relate to the pediatric patient's pathophysiology of cardiopulmonary disease.

86.287 Practicum in Critical Care 4 Q.H.
(Prereq. 86.274, 86.278 concurrently)

The course is designed to allow the student to select an area of emphasis from among the following: intensive care units, neonatal-pediatrics, or extracorporeal membrane oxygenation. During the practicum courses students are

provided with an opportunity to work in their specialty areas.

86.288 Practicum in Critical Care 4 Q.H.
(Prereq. 86.287)

This is a continuation of 86.287.

86.290 Rehabilitation of Children with Respiratory Disorders 4 Q.H.

The course applies a broad definition of rehabilitation to the life situations of children with respiratory disorders. Students will have the opportunity to learn specific skills that address the recognition and management of acute and chronic problems. Model systems of psychosocial as well as physical support based on these skills will be developed. The course is open to students in health or human service

disciplines who have had clinical or field experience.

86.291 Practicum in Pediatric Pulmonary Rehabilitation 1 Q.H.

(Prereq. 86.290 or permission of instructor; enrollment limited)

Counselorship under medical direction at a one-week summer camp for children with severe pulmonary disorders. Students will apply skills acquired in 86.290 in residential camp situation and respond to medical or psychosocial problems in a manner consistent with current methods in his/her discipline. Group and individual discussions with the instructor will clarify insights and experiences. Daily case reports will document the learning process.

Physician Assistants

26.290 Medical Ethics 3 Q.H.

This course is designed to help familiarize students with various philosophical perspectives in medical ethics, including historical, classical, ethical, and contemporary philosophies regarding issues such as abortion, truth telling, genetic control, and the allocation of scarce medical resources. Euthanasia and paternalism are among topics discussed during the course.

86.120 Roles, Rules, and Resources for Physician Assistants 2 Q.H.

This course is designed to help students who wish to understand the role of physician assistants, including the manner in which they interact with other health professionals, as well as the way in which their role is perceived by others. This course is also organized to help the student gain an understanding of the law as it relates to physician assistants' actions and to health care in general. Common resources are also discussed.

86.121 Patient Education and Counseling 2 Q.H.
(Prereq. 86.135)

The purpose of this course is to provide students an opportunity to acquire the knowledge necessary for application of the teaching-learning process. Lectures demonstrate how to evaluate patients' needs and readiness to learn; identify motivational factors used in teaching patients; and develop common teaching techniques for issues such as childhood operations, chronic disease management, ostomies, and mastectomies.

86.122 Medical Care and Current Social Problems 2 Q.H.

This course covers the principal components of the health care delivery system, with emphasis on services, organization, and funding. Selected

social problems are used to demonstrate the operation of the medical care system.

86.123 Principles and Concepts of Emergency Medicine 3 Q.H.

(Prereq. 86.236, 86.237)

This course offers an introduction to the principles of life-support techniques. Emphasis is placed on the initial management of acute medical and traumatic conditions in hospital and pre-hospital situations. Students are instructed in basic cardiopulmonary resuscitation techniques.

86.124 Clinical Nutrition 3 Q.H.

The course covers the physiological function of essential nutrients; the need for individual nutrients and their food sources; food fads and food additives; the role of nutrition in heart disease, diabetes, common gastrointestinal disorders, obesity, and hypertension.

86.125 Human Anatomy 3 Q.H.

This course covers the basic structure of the human body, with emphasis on the gastrointestinal, cardiovascular, respiratory, and musculoskeletal systems. The didactic sessions are complemented by mammalian dissection.

86.134 Essentials of Physical Diagnosis 5 Q.H.

Course content includes techniques of obtaining and presenting an accurate history; performing a competent and thorough physical examination; and synthesizing the results of the history, physical, and laboratory findings to arrive at an accurate evaluation of the patient. Discussion, demonstrations, and patient workups are used to assist students in building these skills.

86.135 Principles of Interviewing 2 Q.H.

Various methods of interviewing patients are covered. Emphasis is placed on establishing a

relationship and understanding the effects of cultural background and psychosocial problems on the patient's response to illness, goal setting, and personality types.

86.139 Physiological Basis of Disease 2 Q.H.
(Prereq. 86.239)

Class sessions focus on the anatomy and physiology of the neurological system; understanding the functioning of nervous pathways, sensations, and motor neurons; disorders and disease states; and treatment and management.

86.142 Principles of Pediatrics I 3 Q.H.
(Prereq. 86.134)

The course offers a study of both the physiological and psychological fundamentals of child development, including immunizations and their administration, indication, or contraindication. Emphasis is on the major common pediatric illnesses, their signs, symptoms, and treatment regimens; various types of medications used in pediatrics, their indication and dosage in relation to specific disorders; and the management of pediatric emergencies such as cardiac arrest, anaphylaxis, convulsions, coma, and high fevers.

86.143 Principles and Concepts of Surgical Intervention in Disease Processes 3 Q.H.
(Prereq. 86.236, 86.237)

Students are introduced to major surgical conditions, with emphasis on indications for surgical intervention and pre- and post-operative management.

86.145 Principles of Psychiatry 3 Q.H.

This course offers students the opportunity to learn to understand and work with patients and families exhibiting psychiatric problems. Topics include psychological growth and development, the effect of social milieu on behavior, the psychological bases of drug and alcohol abuse, and the dynamics of emotional psychosomatic problems.

86.146 Basic Diagnostic Radiology 2 Q.H.

The course provides an introduction to the underlying principles, use, and interpretation of radiographs pertinent to primary care medicine.

86.147 Principles of Obstetrics and Gynecology 3 Q.H.
(Prereq. 86.134)

This course focuses on the anatomy and physiology of human reproduction: normal conception, pregnancy, and delivery; problems in conception; the management of pre- and post-natal periods; and the care and resuscitation of the newborn. Emphasis is on the causes, signs, and treatment of common gynecological problems, including the significance of early cancer detection. Different methods of contraception, the effectiveness of each method, and the contraindication, if any, are covered. The course also covers the medical indications for

abortion and the appropriateness of the various methods of pregnancy termination.

86.148 Survey of Rehabilitation Medicine 4 Q.H.
(Prereq. 86.236, 86.237, 86.238)

This course provides students an opportunity to learn techniques of effective planning and decision making for patients with multiple chronic problems. The purposes, techniques, and potential of rehabilitation medicine are also discussed.

86.149 Fundamentals of Electrocardiography 2 Q.H.
(Prereq. 86.236, 86.237)

Basic principles of electrophysiology and its application to electrocardiographic tracing are discussed. Instruction focuses on recognizing arrhythmias, rate and axis determinations, conduction abnormalities, characteristic changes seen in myocardial infarction and ischemia, as well as drug and metabolic effects manifested on the electrocardiogram. Students have the opportunity to gain experience in implementing their knowledge in interpretation of EKGs through slide presentations and teaching-file EKGs. Although not part of this course, instruction is also offered in the technique of taking a twelve-lead electrocardiogram.

86.172 Medical Therapeutics 3 Q.H.
(Prereq. 73.114, 86.236, 86.237, 86.238)

A case-study format involving students in planning the management of common-disease states is used to help students understand the clinical use of common therapeutic agents.

86.236 Pathophysiology and Medicine 3 Q.H.

This course offers a systems approach to the principles of disease processes in people. Topics include physiology, pathophysiology, the natural history of disease, diagnostic procedure, and therapeutic measures. Pathobiology, hematology, gastroenterology, and pulmonary problems are usually covered in this portion of the course.

86.237 Pathophysiology and Medicine 3 Q.H.
(Prereq. 86.236, 86.134)

Continuation of course from previous quarter. Prerequisite: 86.236 (see Quarter I). Cardiology, immunology, rheumatology, and renal problems are usually covered in this portion of the course.

86.238 Pathophysiology and Medicine 3 Q.H.
(Prereq. 86.236, 86.237, 86.134)

Continuation of course from previous quarter. Dermatology, oncology, infectious disease, and endocrine problems are usually covered in this portion of the course.

86.239 Medical Physiology 6 Q.H.

This course introduces a systematic approach to human physiology, offering in-depth study of gastrointestinal function, respiratory mechanics, endocrine function, cardiovascular dynamics, and renal and electrolyte functions.

86.240 Introduction to Clinical**Rotations****4 Q.H.**

Clinical rotations, expectations, and requirements are presented to students about to enter their clinical year. Some review of history taking and physical examination skills is conducted, and students are instructed in various clinical procedures.

86.241 Applied Study in Emergency**Medicine****4 Q.H.**

During this rotation, the student has the opportunity to become familiar with the problems encountered in an emergency room. The student is responsible for taking medical histories and performing physical examinations on acute as well as non-emergency patients and presenting these to the medical preceptor. When appropriate, the necessary diagnostic and therapeutic measures are taken. Through didactic sessions at the clinical site, as well as clinical training, the student may also be exposed to the emergency management and treatment of conditions such as trauma, shock, burns, asthma, poisoning, allergic reactions, seizures, and respiratory failure.

86.242 Applied Study in Medicine**4 Q.H.**

Rotating through hospitals, clinics, and private office settings, the student is given the opportunity to take and record histories and perform physical examinations. In attending medical rounds and conferences, performing diagnostic procedures, presenting case write-ups, recording progress notes, and working under the supervision of a doctor of medicine, the student has the opportunity to become versed in the assessment and management of a variety of medical problems seen in primary care. Emphasis is placed on the skills of: 1) collecting, assessing, and presenting patient data for physician review; 2) ordering appropriate laboratory and diagnostic studies; 3) counseling patients in therapeutic procedures; and 4) helping to coordinate the contributions of other health professionals in the management of the patient.

86.243 Applied Study in Pediatrics**4 Q.H.**

During the pediatric rotation, the student has the opportunity to become familiar with outpatient pediatric problems through training in clinics and private pediatric offices. Emphasis during this training is on caring for the child from birth through adolescence. Students are given the opportunity to take histories and perform pediatric physical examinations. Diagnosis and management of common childhood illnesses and evaluation of the variations of growth and development are also stressed. Students have the opportunity to develop skills with which to counsel parents on immunizations, child visits, parameters of growth and development, common psychosocial problems, nutrition, and

accident and poisoning prevention. Students may also have the chance to learn how to administer immunizations and, when possible, to do audio and visual screening.

86.244 Applied Study in Psychiatry**4 Q.H.**

The student is offered exposure to a wide variety of psychiatric problems. Clinical settings include wards, clinics, multiservice centers, and nursing homes. Students are expected to perform mental status exams and to do cognitive testing. Emphasis is on recognizing various types of psychiatric problems that require referral to a specialist and managing those problems that can be handled by the non-specialist. Rotations may also assist students in furthering their understanding of effective patient interactions and the psychiatric components of health, disease, and disability.

86.245 Applied Study in Obstetrics**and Gynecology****4 Q.H.**

The student on rotation has the opportunity to become involved with obstetric and gynecological services provided by teaching hospitals in the Boston area. The emphasis in obstetrics is on pre- and post-natal care, monitoring a woman in labor, assisting in deliveries, and developing the skill necessary to deliver a child in an emergency situation. Students have the opportunity to take obstetrical histories and perform obstetrical examinations. While rotating through gynecology, the student is expected to learn how to assess and manage a variety of common gynecological problems and to counsel patients on family planning.

86.246 Applied Study in Primary Care**4 Q.H.**

Students on primary care rotations are offered exposure to aspects of general medical and family practice with emphasis placed on personalized care of well and sick patients. Patient education, counseling, and integration of community services, as well as medical diagnosis and management, are considered a major part of this rotation.

86.247 Cancer Prevention**3 Q.H.**

(Prereq. 86.135, 86.134, 86.236, 86.237)

Principles of primary and secondary prevention of cancer are presented. Included in the course is information on biostatistics, cancer as a public health problem, and cancer epidemiology.

86.248 Principles of Orthopedics**3 Q.H.**

(Prereq. 86.146)

Students have the opportunity to learn about common orthopedic problems, including those of the hand, knee, shoulder, and back. Special problems of acute trauma and the management of uncomplicated orthopedic cases are examined. Instruction also focuses on the techniques of completing an adequate patient history and physical examination of the orthopedic patient.

86.249 Principles of Pediatrics II 3 Q.H.

(Prereq. 86.142)

Continuation of course from previous quarter.

87.109 Basic Medical Laboratory Science 3 Q.H.

This course covers basic laboratory methods employed in primary care, including urinalysis, gram staining, hematocrit, hemoglobin, sedimentation rate, white cell count, and differential. Extensive laboratory practice is included.

73.114 Basic Pharmacology 3 Q.H.

This course provides students an opportunity to learn the classification, mechanisms of action, and uses of a broad spectrum of therapeutic agents. Dose response and untoward side effects are emphasized.

**Physician Assistants
(Graduate Courses)****21.841 The Aging Process 3 Q.H.**

Socioeconomic and social-psychological consequences of aging are examined from the perspective of health care providers. A major part of the course focuses directly on the biological changes entailed in aging and the appropriate medical management of geriatric patients. Open to students expected to provide health care services to geriatric patients.

86.800 Primary Care 3 Q.H.

This course deals with the approach to and management of the patient in a primary care setting. Specific diseases and medical conditions common to primary care practice will be discussed, such as low back pain, anxiety, fatigue and weight loss, chest pain, gastrointestinal problems, upper respiratory infections, obesity, and dermatologic complaints. Attention will be paid to psychosocial aspects of disease as well as aspects of prevention.

Military Science**91.150 Leadership Lab I 0 Q.H.**

Introduction of first-year ROTC students to the basic tenets of discipline and regimentation of the U.S. Army. Includes the basics of proper wear of military clothing, proper rendering of military courtesies, military customs and traditions, individual and group drill and ceremonies, manual of arms for the M16A1 rifle, and physical fitness training. Attendance required for all first-year cadets enrolled in an ROTC course.

91.151 The Army Structure 1.5 Q.H.

An introduction to the Army's force structure and its relation to the other military services at Defense Department level. The course analyzes the Army's major command groups down to division level to include mission, location, and branch requirements. The course defines each Army branch (infantry, armor, field artillery, etc.) to include the branch mission and nature of the primary duty associated with an officer's assignment to a particular branch.

91.152 American Military Heritage 1.5 Q.H.

Course traces the evolution of the military profession and its attendant institutions. Emphasis is on the development of professionalism in the officer corps. The course is designed to enable the student to explore the implications of service as a professional Army officer in today's Army.

91.153 Tactical Simulations 1.5 Q.H.

Mission, organization, and composition of the basic infantry rifle squad. Includes basic combat

formations, movement techniques, unit capabilities, and planning considerations. Uses the Dunn-Kempf wargame in a series of practical exercises that apply classroom instruction through use of a boardgame and miniatures simulating the modern battlefield.

91.160 Leadership Lab II 0 Q.H.

Introduction and hands-on training for the second-year ROTC cadets. Includes required basic military skills, including nuclear, biological, and chemical protective training; selected weapons training; use of U.S. Army communications equipment; land navigation; orienteering; rappelling; and limited military vehicle maintenance training. Attendance required for all second-year ROTC cadets enrolled in an ROTC course.

91.161 Marksmanship 1 Q.H.

Instruction and practical application in basic rifle marksmanship techniques, safety, and range operation. The course will cover sanctioning bodies rules for small-bore rifle competition firing, preparation for competition firing, preparation for competition, and intra-class competition.

91.162 Contemporary Military Doctrine 1.5 Q.H.

The historical development of U.S., Soviet, and other selected military philosophies and resultant force development and employment are presented as a basis for the examination of the organization, weapons, equipment, doctrine, tactics, and capabilities of combat, combat support, and combat service support units.

91.163 Advance Tactical Simulations 1.5 Q.H.
Application of tactics at battalion through division level using low-resolution, map-maneuver wargames such as "Pegasus" and "First Battle in European Settings." The planning and combat phases will include all considerations normally associated with conventional combat, e.g., logistics, personnel, administration, transportation. 91.153, Tactical Simulations, prerequisite.

91.164 Insurgency Since 1945 1.5 Q.H.
A study of the nature of insurgency to include the leadership of both the recognized government and the dissident force, the nature of the cause of insurgency, and an analysis of selected insurgencies using case studies. Two case studies will be selected from the following: Malaya, Philippines, Algeria, and Venezuela.

91.165 Great Battles of Military History 1.5 Q.H.
This course analyzes some of the great battles in military history. Methods of analysis include investigation of military theory and doctrine, generalship, strategy, tactics, logistic administration, technology, and the socio-political-economic factors that resulted in the battles' outcomes.

91.250 Leadership Lab III 0 Q.H.
Advanced military skills training, especially physical readiness and leadership practical application, preparing third-year ROTC cadets for attendance at Advanced Leadership Lab V (ROTC 6-week summer camp), Fort Bragg, NC. Attendance required for all third-year ROTC cadets enrolled in an ROTC course.

91.251 Land Navigation 2 Q.H.
Identify map symbols to natural and manmade features; identify/use military grid reference system; measure straight line and read distance on a map; measure and plot an azimuth; convert azimuth from grid to magnetic grid; grid; locate an unknown point using polar coordinates; locate an unknown point using intersection; locate an unknown point using resection; locate an unknown point using modified resection; determine the evaluation of a specific point on the map. Inspect a compass for accuracy; navigate from one point on the ground to another.

91.252 Methods of Instruction 2 Q.H.
This course provides an introduction to the concept of training management, including the fundamentals of teaching, principles of learning, and the establishment of training objectives. In addition, students will demonstrate proper instructional techniques and lesson plan preparation and conduct classroom instruction. For the most part, specific emphasis is given to hands-on student participation and performance-oriented training.

91.253 Military Teams 2 Q.H.
Introduction to the fundamentals of offensive and defensive combat at the squad and platoon levels, continuing on through combined-arms tactics at the company level. Includes unit organizations and capabilities, tactical planning, combat orders; utilizes practical exercises placing the student in leadership roles in simulated tactical environments.

91.254 Advanced Leadership Clinic 2 Q.H.
Classroom, programmed instruction, and practical exercises (e.g., land navigation, physical conditioning, weapons familiarization, and leadership) designed to prepare cadets for maximum individual performance at the 6-week ROTC advanced camp, Fort Devens, MA. This course is required for all cadets attending advanced summer camp at Ft. Bragg, NC.

91.260 Leadership Lab IV 0 Q.H.
Practical application of previously learned skills, techniques, education, and experience by fourth-year ROTC cadets by assisting ROTC cadre in the conduct of 91.150, 91.160, and 91.250. Cadets prepare and present instruction, manage constrained resources, and supervise subordinates. Evaluation is based on active-duty Army criteria. Attendance required for all fourth-year ROTC cadets enrolled in an ROTC course.

91.261 Organizational Dynamics 2 Q.H.
This course will examine the theory, methods, and principles for understanding and motivating human behavior in organizations. The principles and dynamics of leadership will be emphasized and directed toward the development of leadership styles. Practical applications will be made through the use of case studies and group processes.

91.262 Military Law 2 Q.H.
This course considers in detail the issues and responsibilities imposed by law on commanders and staff officers in two broad areas: the military criminal justice system and military administrative law. Practical guidance for identifying and resolving issues of law is stressed. In the criminal law area, the course presents in-depth analysis of the responsibilities and duties of officers and non-commissioned officers concerning the military justice system. Administrative law subjects focus on the legal basis for command and on administrative due process; judicial review of military activities and other topical issues in this area of law.

91.263 The Military as a Profession 2 Q.H.
This seminar course provides the advanced ROTC student with the opportunity to examine the military as a profession and to discuss military professional ethics. The course will address the characteristics, uniqueness, and roles of the profession of arms and responsi-

bilities of the professional soldier to the Army and the nation. Students will develop an understanding of the need for ethical conduct and an awareness and sensitivity to ethical issues. The course will present case studies on current issues and discuss problems typically encountered by new officers.

91.299 Advanced Leadership Lab V 6 Q.H.
External leadership lab conducted at Fort Bragg, North Carolina, during the summer quarter. Intensive 6-week course includes application of leadership principles in positions at varying levels of responsibility. Supplemental instruction includes: physical conditioning, counseling, senior-subordinate relations, tactical doctrine, international laws of land warfare, and approaches to problem solving. Course attended by students from 123 colleges and universities from Maine to Florida. All expenses are borne by the U.S. Government, including an approximate \$500 stipend.

91.201 The Air Force Today 1 Q.H.
Examines the role of the U.S. Air Force in the contemporary world. Topics include background, mission, and organization of Air Force and functions of U.S. strategic forces. Also, emphasis is placed on development of written communicative skills.

91.202 Leadership Laboratory I 1 Q.H.
Introduction to the customs, traditions, and courtesies of the Air Force through guest speakers, seminars, and a field trip to an Air Force base.

91.203 Air Force Today 1 Q.H.
Continues study of the contemporary Air Force by examining general purpose forces, aerospace support forces, and the total force structure.

91.204 Leadership Laboratory II 1 Q.H.
Continues 91.202 with emphasis on the role and responsibilities of an Air Force junior officer.

91.205 The Development of Air Power 1 Q.H.
History of the development of air power from balloon experiments up through World War II. Emphasis on interrelation of technology, doctrine, historical events. Student participation and presentations are emphasized to enhance verbal communicative skills.

91.206 Leadership Laboratory III 1 Q.H.
Emphasizes development of techniques used to direct and inform. Students are assigned leadership and management positions in the 91.202 programs described above.

91.207 The Development of Air Power 1 Q.H.
History of airpower since 1946, with emphasis on the U.S. Air Force. Includes the role of air forces in conflicts and the effect of space-age technology on air power. Also an examination of

the employment of U.S. air power in peaceful ways.

91.208 Leadership Laboratory IV 1 Q.H.
Continues 91.206. Adds a special program in preparation for field training.

91.209 The Military in American Society 4 Q.H.
Study of the military's role as an institution in a democratic society. Topics: civil-military interaction and the military as a profession. Emphasis on developing communicative skills through student presentations.

91.210 Leadership Laboratory V 1 Q.H.
Exercise of management functions in planning, supervising, and directing cadet group activities. Opportunity to acquire proficiency in military leadership skills.

91.211 U.S. National Security 4 Q.H.
Study of the role of the military in maintaining the security of the United States. Examines the international environment, the background of defense policy, strategy, and forms of conflict. Addresses specific issues, including weapons acquisition, arms control, nuclear deterrence, and the national military decision-making process.

91.212 Leadership Laboratory VI 1 Q.H.
Continues 91.210. Students prepare themselves for professional duties.

91.213 Management and Leadership I 4 Q.H.
Management and leadership from the point of view of the Air Force junior officer. The individual motivational and behavioral processes, leadership, communication, and group dynamics are covered to provide a foundation for the development of the junior officer's professional skills as an Air Force officer.

91.214 Leadership Laboratory VII 1 Q.H.
Supervisory practice and exercise of leadership functions in controlling and directing activities of the cadet group. Development of leadership potential in a practical, supervised training laboratory.

91.215 Management and Leadership II 4 Q.H.
Continues 91.213 with special emphasis on the basic managerial processes involving decision making, utilization of analytical aid in planning, organizing, and controlling in a changing environment. Organizational and personal values, management of forces in change, organizational power, politics, and managerial strategy and tactics are discussed within the context of the military organization. Actual Air Force cases are used to enhance the learning and communication processes.

91.216 Leadership Laboratory VIII 1 Q.H.
Continues 91.214. Emphasis on supervisory and leadership skills. Emphasis on advantages of an Air Force career.

Cooperative Education

90.114 Life/Career Planning 4 Q.H.

(Prereq. Juniors and seniors only)

Highly participatory classes, open to juniors and seniors in any of the Basic Colleges, focus on career exploration, self-assessment, job-search techniques, and networking. Students are required to prepare a professional resume, participate in videotaped mock interviews, research careers, and investigate graduate and professional schools.

90.130 Career Advisement for Criminal Justice I 1 Q.H.

(Prereq. Criminal Justice freshmen only)

The first in a three-course sequence, taught by the students' freshman adviser, aims to assist students in adjusting to college life, developing college survival skills, and becoming familiar with the broad range of careers in the field of criminal justice. Classes are augmented with individual meetings with the instructor/adviser.

90.131 Career Advisement for Criminal Justice II 1 Q.H.

(Prereq. 90.130 or permission of freshman adviser)

Students are introduced to cooperative education and its implications for career planning. Work and personal values, interests, skills, and lifestyles are examined in terms of their relation to career options within the field of criminal justice.

90.132 Career Advisement for Criminal Justice III 1 Q.H.

(Prereq. 90.131)

The final course in the three-course sequence is devoted to the preparation of a personal résumé, an introduction to interviewing techniques, and the setting of short-term educational and vocational goals. Students are required to research criminal justice jobs using the career exploration system.

90.135 Professional Development for Journalists 1 Q.H.

(Prereq. Journalism freshmen only)

The course contains current career information in the field of journalism. It is designed to prepare journalism students for the cooperative education experience as well as to introduce them to the academic preparation necessary to pursue a successful career in the journalist profession. The course teaches effective résumé writing, letters of application, and interviewing techniques specifically geared to those who intend to pursue a career in journalism.

90.180 Career Decision Making 4 Q.H.

(Prereq. Freshmen or sophomores in any major or permission of instructor)

A life/career planning course designed to meet the needs and concerns of students who may be undecided or uncertain about their academic major or career direction. Activity-oriented classes and workshops address the needs of the group, as well as individual participants, and emphasize self-assessment, career exploration, decision making, and goal setting.

90.220 Working in the United States 4 Q.H.

(Prereq. International students only)

A career development course for international students only. The course is designed to help international students compete more effectively for cooperative education positions in the United States.

90.251 Placement Techniques 1 Q.H.

Career selection and development are discussed concurrently with resume preparation, interviewing techniques, and effective written communication to facilitate the planning and implementation of a professional career program.

90.253 Professional Development for Teachers 1 Q.H.

The course offers an examination of the following topics: analysis of the job market for teachers, role of the Education Placement Office, alternative careers for education graduates, graduate study, and certification procedures. A discussion of resume preparation and interviewing techniques is also included.

90.256 Career Management in Physical Therapy 1 Q.H.

Career management in physical therapy is examined in view of professional development and career opportunities; other discussions include resume preparation, communications, and the interview process.

90.260 Nursing Career Management 4 Q.H.

The course provides the opportunity to explore traditional and non-traditional nursing careers and education, the world of work, personal and work values, lifestyle, and career management techniques including skills identification, resume writing, sources of career information, evaluating an employer, assertiveness, and selected current issues relevant to nursing careers.

90.265 Professional Development for Civil Engineers 4 Q.H.

The course is designed to foster self-assessment skills and to enhance personal and professional growth, as well as to provide a forum for civil engineering students to exchange views on current professional issues and topics.

Criminal Justice

92.104 Administration of Criminal Justice 4 Q.H.

This course surveys the contemporary criminal justice system from the initial contact with the offender through prosecution, disposition, incarceration, and release to the community. Emphasis is placed on major systems of social control: police, corrections, juvenile justice, mental health systems, and their policies and practices relative to the offender. A balance is maintained in providing legal, empirical, and sociological materials.

92.107 Human Factors In Policing 4 Q.H. (Prereq. 92.115)

This course focuses on the theory and practice of human relations and conflict management necessary for effective policing. It is recommended for those with a career interest in policing.

92.108 Survey of Correctional Systems 4 Q.H. (Prereq. 92.137)

The course offers an introduction to penology and corrections, exploring the public reaction to convicted offenders historically, while concentrating on issues and programs of contemporary corrections.

92.110 Police-Community Relations 4 Q.H. (Prereq. 92.131, 92.115, and junior or senior status)

The course covers police-public contact; uses of the communications media in projecting the police image; responsibilities of police in dealing effectively with minority groups, civil rights, civil disorder, and public protection. An exploration of the role and function of the police in intergroup relations is also included.

92.114 Criminal Justice Research 4 Q.H. (Prereq. 10.110 or equiv., and middler, junior, or senior standing)

This is a survey course of methods for basic and applied research in criminal justice, combining statistics and research methods. While providing minimal research literacy, this course concentrates on research application by stressing discussion of the general role of research in the discipline and specific contributions advanced by studies in the literature.

92.115 Police Operations 4 Q.H. (Prereq. 92.131)

The course offers a general survey of police operational procedures, including patrol, traffic, interrogations, and report writing. Role playing is used extensively to demonstrate interviewing methods.

92.116 White-Collar Crime 4 Q.H.

Intends to give the student a basic understanding of white-collar crime. The course will cover such topics as: nature and extent of white-collar crime, the social-psychologic makeup of white-

collar crime—typologies, present efforts directed toward controlling it, and understanding the interagency and jurisdictional problems and the benefits of cooperation.

92.127 Terrorism 4 Q.H.

Attempts to give the student an understanding of what terrorism is and why it has become so popular. Topics examined will include: the role of news media, political consequences of terrorism, the military as a resource, and the role of the hostage.

92.128 Introduction to Private Security 4 Q.H.

The course examines the organization and administration of security and loss prevention programs in industry, business, and government. Emphasis is placed on the protection of assets, personnel, and facilities, and focuses on the relations between security organizations and government agencies.

92.129 Criminal Justice Planning 4 Q.H.

(Prereq. 91.157; a statistics course; and middler, junior, or senior standing)

The course examines criminal justice planning theory and methods. Emphasis is on the need for criminal justice planning and the tools used in the planning process. Students in small groups are expected to prepare a sample criminal justice plan during the term.

92.130 Criminalistics I: Criminal Investigation 4 Q.H.

The course focuses on criminal investigation dealing with areas of investigation, case preparation, and applied physiology.

92.131 Law Enforcement Administration and Management 4 Q.H.

The course covers the principles of police organization, administration, and management, including staff and line functions, chain of command, span of control, selection of personnel, and promotional systems. Consideration is also given to special problems such as strikes, natural and atomic disasters, narcotic traffic, and vice control.

92.134 Constitutional Problems 4 Q.H. (Prereq. 92.141)

This is a required course focusing on a historical evaluation of the Fourteenth Amendment and its use in making rights prescribed under the Bill of Rights applicable to the individual states. Also detailed in the course are the inherent problems of the Fifth and Sixth Amendments, including the effect of their implications on such matters as police practices, illegal search and seizure, and right to counsel. Students are expected to be familiar with basic concepts as well as changing interpretations so that they can cite cases that may stand as precedents for conclusions they draw.

92.137 Criminology 4 Q.H.
This course covers patterns and evolution of criminal behavior, the social forces involved, and development of the individual criminal; administration of criminal justice: law, courts, police, prisons.

92.139 Theories in Penology 4 Q.H.
(Prereq. 21.100 and 92.137)

The course offers a philosophical approach to the development of punishment in the United States, as examined in a historical context. Issues of justice and morality are considered as they are manifested in contemporary penal structure. Readings include selections from eighteenth-, nineteenth-, and twentieth-century novelists, philosophers, and criminologists.

92.140 Criminalistics III: Arson and Fire Investigation 4 Q.H.

A course in the examination and behavior of fire. Deals with fire-related phenomena such as convection, radiation, contact, and ignition and includes consideration of arson, explosions, asphyxiation, and combustibility. The course will also cover fireproofing agents such as plastics, textiles, building materials, and the chemistry of the halogens. Finally, some time is given to areas of fire experimentation and the potential for more sophisticated inquiry.

92.141 Criminal Law 4 Q.H.

The course deals with the area of criminal responsibility, some of its limitations, and certain modifications substantially affecting it. The course requires an ability to express in writing both the knowledge of a particular concept and the ability to identify it in a complex fact pattern and discuss its implications and ramifications.

92.142. Survey of Criminal Evidence 4 Q.H.
(Prereq. 92.141, 92.134)

This survey course focuses upon the fundamentals of criminal trial procedure and the rules of evidence as they apply to the trial of a criminal case. Students are required to read and brief criminal court cases.

92.143 Criminalistics II: Forensic Laboratory 4 Q.H.*
(Prereq. 92.130 and permission of instructor)

The course provides a survey of the elements of microscopy, spectroscopy, and basic chemistry as they apply to the study of firearms, hair, fibers, blood, paint, tools, glass, documents, laundry marks, poisons, and other materials that comprise physical evidence.

92.147 The Administration of Juvenile Justice 4 Q.H.
(Prereq. 21.100, 92.137)

Course work examines the juvenile court, its philosophy, procedure, and personnel. Focus is on the discretionary processes by which

juveniles are labeled delinquent, dependent, and neglected. The roles played by police, prosecution, defense, bench, and social service workers are considered. Field visits are arranged.

92.148 Probation and Parole 4 Q.H.
(Prereq. 92.108)

The course examines the nature and problems of correctional field service, both adult and juvenile.

92.149 Alternatives to Incarceration 4 Q.H.
(Prereq. 92.131 and middler, junior, or senior standing)

This course examines the concept of criminal and juvenile justice in terms of the alternatives to and the consequences of incarceration in total institutions such as jails, prisons, and secure detention homes. It examines current alternatives in light of the history, philosophy, and reality of institutionalization and the theories of punishment.

92.155 Seminar in Law Enforcement 4 Q.H.
(Prereq. 92.131, 92.115, and junior or senior standing)

The course provides an opportunity for free discussion about the numerous problems facing the law enforcement officer. Periodic oral and written reports are required. Guest lecturers are invited to participate in and lead discussion sessions. An effort is made to have students formulate their own philosophy of law enforcement prior to graduation.

92.156 Seminar in Law and Criminal Justice 4 Q.H.

(Prereq. 92.141, 92.134, and junior or senior standing)

Specific topic to be announced.

92.157 Research Methods in Criminal Justice 4 Q.H.

(Prereq. A statistics course and middler, junior, or senior standing)

The course focuses on development of research design of the kind most useful to criminal justice problems; understanding some of the most important issues and problems facing researchers in the field; use of various data collection methods, including observation, interviewing, questionnaire construction, and scales for survey analysis; validity and reliability; computer application in criminal justice.

92.167 Correctional Institutions 4 Q.H.
(Prereq. 92.108)

The course offers an analysis of the organization and administration of correctional institutions.

92.168 Crime and Criminal Justice: A Comparative View 4 Q.H.

(Prereq. 92.104, 21.100, or equiv.)

The course examines the problems of crime and its control from a comparative perspective. Countries such as the Soviet Union, China,

France, East and West Germany, Great Britain, Holland, Finland, and Sweden are analyzed in terms of incidence and type of deviance and crime, as well as in terms of their approach to social control and the prevention of crime. Points of divergence between these countries and the United States will be examined, with regard to their perceived causes of crime and their differing approaches to rehabilitation and crime prevention.

92.170 Women and the Criminal Justice System

4 Q.H.

(Prereq. Middler, junior, senior standing)

This course is intended to introduce students to issues relating to roles taken by women involved with the criminal justice system and to the system's various responses to women in these roles. Specific focus will be directed toward women as victims of crime, as offenders, and as practitioners.

92.181 Police Discretion

4 Q.H.

(Prereq. Middler, junior or senior standing)

This course examines the nature and impact of discretion as it relates to police decision making. Attention is given to various forms of police discretion and ways in which it can be structured, confined, and checked. Students have the opportunity to examine and learn to analyze sample police department policies and study different formal and informal methods of developing policies. Students also study the relation of discretion to controlling police behavior and police corruption.

92.191, 92.192, 92.193, 92.194 Directed Study

(each) 4 Q.H.

92.209 The Female Offender

4 Q.H.

(Prereq. 21.100 and 92.137)

The course addresses itself to the female at various stages in the criminal justice system, from commission of a crime to parole. Both the juvenile and adult offender are studied. The thrust of the course is a critical analysis of existing theory and research on the female offender, with emphasis on the socialization, roles, and social participation of society at large. The male offender is also considered at each level for purposes of comparison.

92.210 Topics in History of Criminal Justice

4 Q.H.

The course provides a historic survey of the principles of criminal justice in the ancient and medieval periods, with emphasis upon the impact of religion and philosophy.

92.211 Topics in History of Criminal Justice

4 Q.H.

A continuation of the historic survey with an examination of the effects of the Renaissance and the Reformation, and the rise of nation states.

92.215 Stigma and Justice

4 Q.H.

(Prereq. Middler, junior, or senior standing)

Student introspection and articulation of ideas are encouraged and expected in this course, which examines the history, theory, and reality of social and legal problems faced by those who are stigmatized. The effect of stigmatization, and the possibility of reintegration of offenders, ex-offenders, mental patients, ex-mental patients, men and women "on the street," addicts, alcoholics, the physically ill or disfigured, dishonorably discharged veterans, etc., are analyzed in the course. The major focus is directed toward an examination of the manner in which the criminal justice system stigmatizes its clientele and how, in turn, some people who are stigmatized by society are much more prone to being clients of criminal justice.

92.216 Evidence I

4 Q.H.

(Prereq. 92.141, 92.134)

The goal of this course is to provide students the opportunity to develop their understanding of the manner in which legal issues and disputes are resolved by trial. Study will focus on the manner in which the trial system works and the reasoning behind the rules governing its operation, including rules of evidence: the mechanics of the adversary system, relevancy, reliability, and rules of exclusion based upon policy considerations other than relevancy and reliability. Learning tools will include videotapes, mock trials, observation of actual court trials, lectures, take-home assignments, and exams.

92.217 Evidence II

4 Q.H.

(Prereq. 92.216)

This course continues with reliability and rules of exclusion, based upon policy considerations other than relevancy and reliability as set forth in Part I.

92.281 Critical Issues in Criminal Justice and Criminology

4 Q.H.

Introduces students to the major issues and ethical considerations facing criminal justice and criminology today. There will be 6 to 8 major critical, moral, and ethical issues discussed. Core topics could be (but are not confined to) the death penalty, abortion, euthanasia, abolition of the insanity plea, victimless crimes (prostitution, drug abuse, gambling), and gun control. These issues will be presented in the format of pros and cons and will involve student presentations or debates.

92.282 Critical Issues in Criminal Justice Administration

4 Q.H.

Provides a comprehensive understanding of the major issues in the functional areas of law enforcement, private security, prosecution, and courts. This course is designed to stimulate and reflect the controversial characteristics of many criminal justice operations. Students are ex-

posed to these debates through the objective presentation of all sides of the issues.

92.291 Organized Crime 4 Q.H.
Provides the student with an understanding of the phenomenon labeled "organized crime." It is approached from the law enforcement perspective; however, the general criminal justice implications are stressed. The corruptive influences of the phenomenon are dealt with, as well as the overzealous enforcement aspects which lead to violations of constitutional safeguards. The nature of intelligence activities and computerized information concerning organized crime are explored, as well as the sensitive privacy issues that are concerned. Problems of definition, identification of participants, attainment of public understanding and support, legal limitations in dealing with the phenomenon, and the involvement of otherwise reputable citizens as consumers or unwitting allies are discussed. Strategies, both present and proposed, for controlling or eliminating organized crime are considered. Finally, the relationship of this phenomenon to "white-collar crime" is evaluated.

92.294 Private Security Operations and Methods 4 Q.H.
(Prereq. 92.128)

A study of the application of physical, personnel, communication, and transportation security methods to functional area security systems. Analysis of industrial, commercial, institutional, transportation, and communication security systems to identify commonalities and

specific needs. Special attention is given to major areas, including banks and financial institutions; airports, airlines; commercial complexes; educational, hospital, hotel, museum, and library facilities; manufacturing, transportation, and retail businesses; computer and communication networks; and governmental installations, contractors, and grantees.

92.295 Private Security Administration and Management 4 Q.H.
(Prereq. 92.294 or 92.128)

Deals with the administrative and managerial roles of the security director. The security director is considered the advocate of security to top management, and, as a member of the management team, is enabled to integrate security into company operations. Special attention is given to the planning, organizing, staffing, directing, controlling, representation and innovation responsibilities of the security director. His or her role in the professionalization of the security vocation, in stimulating research and in dealing with significant issues, is also explored.

92.296 Private Security Science and Technology 4 Q.H.
(Prereq. 92.128 or equiv.)

Acquaints students with options and applications of today's scientific and technological products. An attempt is made to prepare students in the area of security planning and develop in them the managerial skills needed to plan security systems using the state-of-the-art modern-day technology.

Interdisciplinary Courses

93.110 FORTRAN Programming 4 Q.H.
(Prereq. One year college math)

The course focuses on techniques for programming problems on any large computer. Emphasis is on general programming methods using the language of FORTRAN. A large number of example problems are presented in an effort to display the applicability of computers to a wide variety of professional activities. No prior computer experience is required.

93.111 Advanced FORTRAN Programming 4 Q.H.
(Prereq. 93.110)

Higher-level aspects of the FORTRAN language are considered. Topics covered include the use of software packages, the manipulation of large data arrays, processing of nonnumeric information, magnetic tape operations, and data-file management. An introduction to systems analysis is presented, with emphasis on Monte Carlo and queuing simulation techniques.

93.118 Cultural Aspects of International Business 4 Q.H.
(Prereq. Middler standing)

Using a managerial perspective, this course will cover issues that arise when a firm moves from its home country to a host country that may have a different national culture. Although it will usually take the perspective of the U.S.-based firm that operates abroad, it will spend some time on what happens to other national firms operating in the United States and in third country environments. The way in which "corporate culture" evolves in the context of national culture and the impact on managers will be a central issue.

93.120 An Analysis of American Racism 4 Q.H.
This seminar in contemporary aspects of racism in America discusses the cycle by which racism in our institutions helps form our attitudes and the manner in which our attitudes, in turn, shape our institutions. Emphasis is on the practical,

day-to-day aspects of racism, rather than the theoretical and historical.

93.125 COBOL Programming I 4 Q.H.

This course covers fundamentals of computer programming in COBOL. Topics include elementary computer functioning, program organization, input/output operations, arithmetic and data-handling verbs, and program logic development through the use of flow charts. Storage and manipulation of large data files on magnetic tape are introduced. No prior computer experience is required.

93.126 COBOL Programming II 4 Q.H.
(Prereq. 93.125)

Higher-level aspects of the COBOL language are considered. Included are use of decision tables in developing program logic, improving program efficiency; error detection and minimization techniques; bulk data storage in magnetic tape and disc files; storing, merging, updating, sorting, and purging data files; generating reports.

93.130 Professional Practices: Individual and Social Dimensions 4 Q.H.

The course explores the dimensions and dilemmas of freedom and responsibility confronting professional people practicing within limits set by socio-economic conditions, by clients, and by other professionals. Case histories are examined to illustrate the dilemmas professionals face, the choices that are typically made, and the consequences these have on the freedom of the practitioner and on personal and professional integrity.

93.131 Introduction to Women Studies: Image, Myth, and Reality 4 Q.H.

This introductory course in the study of women in society encompasses the historical, political, economic, and social processes that have created both the image and the reality of women in contemporary society. An overview of the many different disciplinary approaches to the study of women.

93.156 Biochemistry 4 Q.H.
(Prereq. 12.144, 12.145)

This introductory course in biochemistry deals with the structures, functions, and metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Mechanisms of enzyme reactions, enzyme kinetics, vitamins, biological oxidation reduction reactions, and bioenergetics are discussed as well as various inborn errors of metabolism.

93.159 Introduction to Art, Drama, and Music 4 Q.H.

An introduction to the basic formal language of music, drama, and the visual arts. The course focuses on such formal elements as space, time structure, color, and interval by showing how these formal elements are, in effect, the "lan-

guage" of the arts, and how they render intelligible a given art form. Lectures, discussions, and visits to museums and performances.

93.160 American Musical Theatre 4 Q.H.

This interdisciplinary course, offered by the departments of Drama and Music, traces the development of the American musical from *The Black Crook* to *A Chorus Line*. The role of musical theatre, both as entertainment and as serious art form, is considered through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loewe, and Cole Porter are studied.

93.165 Humanistic Themes in the Arts 4 Q.H.

An examination of the way in which certain humanistic themes and topics have been interpreted through music, drama, and the visual arts. The themes included are: "The Arts and Identity" and "The Arts and A View of the World," with focus on such topics as "The Arts as Social and Political Commentary." Lectures, discussions, and visits to museums and performances.

93.171 Introduction to Science I 4 Q.H.

93.171 and 93.172 form a two-quarter sequence for nonscience majors, providing an interdisciplinary treatment of basic concepts of the natural sciences, such as energy, gravity, and the atom. The course will also examine the ways in which atoms combine to form the substances that comprise matter.

93.172 Introduction to Science II 4 Q.H.
(Prereq. 93.171)

This course applies principles previously learned in 93.171 to selected topics in biology, chemistry, physics, and geology. The subjects actually covered depend on the interests of the instructor, and, to some extent, on those of the students.

93.175 Individual in Society 4 Q.H.

This team-taught course, jointly offered by the departments of Philosophy and Religion, Drama and Speech, and Sociology, explores the dimensions and dilemmas of freedom and responsibility. The ways in which the self emerges and adapts itself in socially oriented communication processes (including verbal and nonverbal symbolic language) are discussed, especially as these relations exercise constraints on enlightened choice for both individuals and institutions.

93.176 Communication and Quality of Life 4 Q.H.

This course offers students an opportunity to develop a meaning for the concept "quality of life" and to gain knowledge of subjective and objective methods for measuring and assessing that concept. Problems in professions that influence quality of life are then identified, ex-

plored, analyzed, and possible solutions evaluated.

93.180 Physical Biochemistry 4 Q.H.
(Prereq. 18.136 or 93.151)

This course examines physiochemical principles as they apply to biological processes. Topics include chemical equilibria, reaction kinetics, basic thermodynamics, oxidation-reduction reactions, bioenergetics, macromolecules in solution, and transport. The approach is quantitative, and problem solving as a tool for learning is emphasized. Basic assumptions and limitations underlying principles are explained; for the most part, however, rigorous derivations are avoided. Applications to basic experimental techniques in biochemistry are made by way of relevant biochemical examples.

93.185 Molecular Biology 4 Q.H.
(Prereq. 18.136 or 93.151)

The course emphasizes experimental design and proof in macromolecular chemistry and genetics. Studies current theories of the detailed molecular mechanisms for the preservation, expression, and evolutionary development of biological information. Applications to general biological and health problems will be emphasized. A two-hour period each week will be devoted to problem solving, research "game playing," and model building.

93.190 Advanced Biochemistry Laboratory 4 Q.H.
(Prereq. 18.136 or 93.151)

This course offers an intense laboratory experience for advanced undergraduate and graduate students. Experiments will emphasize protein and nucleic acid chemistry.

93.204 Health Professions: Past, Present, and Future 4 Q.H.

This course focuses on social history of the modern health professions. The course explores long-range patterns in the organization and regulation of the health professions, beginning with the Middle Ages and emphasizing the Jacksonian period, industrialization, modern professional organizations, the growing role of the state, responses of the health professions, and the future of health care in the United States under various corporate-government schemes for reorganization and "accountability."

93.226, 93.227 Women's Studies: Seminars in Research 4 Q.H.

These interdisciplinary Women's Studies seminars are required for the minor in Women's Studies. They allow in-depth research on a topic of particular interest to the student. The courses involve little class time, but much consultation with appropriate faculty. The final product of seminar work and research is a major paper.

93.230 Field Experience in Human Services I 4 Q.H.

Human services students are required to fulfill two fieldwork placements during the last two

years of their program. Placement consists of 150 hours on site and generally varies according to the student's interest. Examples of placement sites include community centers, nursing homes, vocational workshops, state and federal agencies for children, and recreational facilities. Experiences are supervised by University staff to maximize the students' learning opportunities.

93.231 Field Experience in Human Services II 4 Q.H.

(Prereq. 93.230 and senior standing)
Continuation of 93.230.

93.232 Senior Seminar in Human Services 4 Q.H.

This course is designed for seniors in human services. The course examines emerging roles and career options within the human services field. Study focuses on self-examination of attitudes and values affecting delivery of services; exploration of ethical issues and dilemmas relevant to human services, grantsmanship and funding issues; staff supervision and development within human services agencies; and refinement of group leadership skills.

93.XXX, 93.YYY, 93.ZZZ Interdisciplinary Honors Seminars (each 4 Q.H.)

One seminar is scheduled for each of fall, winter, and spring terms. Course numbers and content vary from year to year, since seminars are selected competitively from among faculty applications to the Honors Committee. Seminars to be offered are announced in late May for the following school year. A list of seminars offered for the current year is available from the Honors Program Office. Freshmen, sophomores, and middlers who qualify for the Honors Program may enroll. Juniors and seniors are not eligible.

93.249 Honors Seminar: Survey of the Social Sciences 4 Q.H.

This course is designed to provide an introduction to important ideas and scholarship in the social sciences for honors students who have completed the freshman year. A two-week period will be devoted to each of the following disciplines: economics, sociology/anthropology, political science, history, and psychology. Topics covered will vary from year to year depending on the faculty team that teaches the course. Offered in the winter term.

93.250 Honors Seminar: Survey of the Natural Sciences 4 Q.H.

This course is designed to provide an introduction to important ideas and scholarship in the natural sciences for honors students who have completed the freshman year. A two-week period will be devoted to each of the following disciplines: chemistry, biology, earth science, mathematics, and physics. Topics covered will vary from year to year depending on the faculty team that teaches the course. Offered in the spring term.

93.251 Honors Seminar: Survey of the Humanities**4 Q.H.**

This course is designed to provide an introduction to important ideas and scholarship in the humanities for honors students who have

completed the freshman year. A two-week period will be devoted to each of the following disciplines: art, music, drama, literature, and philosophy. Topics covered will vary from year to year depending on the faculty team that teaches the course. Offered in the fall term.

Alternative Freshman-Year Program

The following courses will be offered in the Alternative Freshman-Year Program during the 1983/1984 academic year.

10.100 Mathematical Preliminaries I**4 Q.H.**

A review of pre-college mathematics, primarily arithmetic. Topics covered include operations with numbers, fractions, decimals, percents, and graphs (pictographs, bar graphs, circle graphs, etc.), together with applications of these skills and concepts. The sequel of this course is 10.110.

10.110 Mathematical Preliminaries II**4 Q.H.**

A survey of precollege algebra, including signed numbers, exponents, multiplication of polynomials, factoring, linear equations, graphing, and radicals. The course is intended for students whose background in pre-college algebra is weak.

10.118 College Mathematics for Business**4 Q.H.**

Topics include sets, rectangular coordinates and graphs, functions and functional notation, linear and quadratic functions, exponential and logarithmic functions, systems of linear equations; summations, inequalities, permutations and combinations, elementary probability concepts, arithmetic and geometric progressions, simple and compound interest, annuities.

21.401 Principles of Sociology I**4 Q.H.**

An introduction to basic concepts and theories relating to the study of humans as participants in group life. Socialization, culture, social structure, primary groups, family, social stratification, and population are emphasized.

21.402 Principles of Sociology II**4 Q.H.**

(Prereq. 21.401)

A continuation of 21.401, Principles of Sociology I, with emphasis on critical analysis of American society with particular attention to problems of social, political, urban, and industrial change.

22.401 Introduction to Political Science I**4 Q.H.**

A study of the basic political concepts and forces of organization from the classical Greeks to the modern nation-state. The Soviet Union and the United Kingdom are contrasted as contemporary illustrations of the institutional distinction between a totalitarian and a constitutional system.

22.402 Introduction to Political Science II**4 Q.H.**

Consideration of the development of operational liberty in the United States and its constitutional underpinnings. Analysis of the national American political process and the conduct of recent American foreign relations.

23.309 History of Civilization A**4 Q.H.**

The major ideas and institutions of civilization from ancient times to 1648.

23.310 History of Civilization B**4 Q.H.**

(Prereq. 23.309)

A continuation of 23.309, covering the period since 1648.

30.400 Fundamentals of English I**4 Q.H.**

An intensive introduction to the principles of effective expository writing; emphasis on description, paragraph construction, and organization; review of the conventions of English usage, punctuation, and syntax; essay assignments.

30.402 Fundamentals of English II**4 Q.H.**

Intensive instruction in exposition, argument, and academic essay writing; instruction in the writing of a research paper; continued emphasis on the conventions of English usage, punctuation, and syntax; essay assignments.

39.601 Economics I**4 Q.H.**

Topics include development of macroeconomic analysis; review of national income concepts; national income determination fluctuation and growth; role of the banking system and the Federal Reserve System; government expenditures and taxation; international trade; and balance of international payments.

49.499 Intensive Management and Organization**4 Q.H.**

The course offers an introduction to the setting and general structure of American business, the characteristics of private enterprise, and the nature and challenge of capitalism and other forms of economic enterprise. The forms of business, the structure of organization, and the functions of management are discussed in the context of their influence on the various forms of business. Through lecture and class discussion

the student is given an overview of the methodologies used in planning, organizing, directing, and controlling the functions of production, marketing, sales, pricing, and finance.

**51.531 Integrated Language Skills
Development I**

2 Q.H.

This course strives to improve a student's reading comprehension and related study and language skills. The course devotes time, discussion, and considerable practice to meaning skills such as basic reading comprehension and interpretation, including work in critical

reading and other interpretational acts (inferences, understanding imagery, and symbolic usage). Study skills, previewing, finding main ideas and details, outlining and summarizing, and classification are also covered. There is continuous interaction and integration of all the communications skills: reading, writing, listening, and speaking.

**51.532 Integrated Language Skills
Development II**

2 Q.H.

(Prereq. 51.531)

A continuation of 51.531.

Academic Calendar 1983-1984

September 1983

5	Monday	LABOR DAY. University closed.
1-7	Thursday- Wednesday	Final examinations for Basic Colleges.
8-21	Thursday- Wednesday	Division A vacation.
15	Thursday	FALL COMMENCEMENT.
21	Wednesday	Beginning of 1983-1984 academic year. Upperclass registration for Divisions A and C. Boston and Burlington Campus freshmen complete their registration. No Basic College classes today. Start of Basic College classes.
22	Thursday	

October 1983

10	Monday	COLUMBUS DAY. University closed.
----	--------	----------------------------------

November 1983

11	Friday	VETERANS DAY. University closed.
24-27	Thursday- Sunday	THANKSGIVING DAY recess.

December 1983

12-16	Monday- Friday	Final examinations for Basic Colleges.
19-Jan 2, 1984	Monday- Monday	CHRISTMAS vacation.

January 1984

2	Monday	NEW YEAR'S DAY. University closed.
3	Tuesday	Upperclass registration, Divisions B and C. No Basic College classes today.
4	Wednesday	Freshman Registration 9 a.m. classes begin 1:35 p.m.
16	Monday	MARTIN LUTHER KING, JR.'S BIRTHDAY observed. University closed.

February 1984

20	Monday	WASHINGTON'S BIRTHDAY. University closed.
----	--------	---

March 1984

19-23	Monday- Friday	Final examinations for Basic Colleges.
26-31	Monday- Saturday	Vacation period for all students in all colleges and schools (Division B vacation).

Academic Calendar 1983-1984

April 1984

2	Monday	Registration for Division A and C students and Division B seniors. Registration for freshmen (Quarter Three) at Boston Campus and Burlington Campus, and for January freshmen (Quarter Two). Beginning of Spring Quarter. Beginning of Division B work period. No Basic College classes today.
16	Monday	PATRIOTS' DAY. University closed.

May 1984

28	Monday	MEMORIAL DAY. University closed.
----	--------	----------------------------------

June 1984

11-15	Monday-Friday	Final examinations for Basic Colleges.
17	Sunday	COMMENCEMENT.
19-23	Monday-Friday	Division A vacation.
25	Monday	Registration for Divisions B and D and January freshmen (Quarter Three). Beginning of Summer Quarter. Beginning of Division A work quarter. No Basic College classes today.
29	Friday	Monday schedule followed.

July 1984

4	Wednesday	INDEPENDENCE DAY observed. University closed.
5	Thursday	No Basic College classes.

September 1984

3	Monday	LABOR DAY. University closed.
4-7	Tuesday-Friday	Final examinations for Basic Colleges.
10-19	Monday-Wednesday	Division B vacation.
13	Thursday	FALL COMMENCEMENT.



Description of Courses

**Graduate School of
Boston-Bouvé College of
Human Development
Professions**

Northeastern University
Boston, Massachusetts

Contents

Foundations of Education	5
Curriculum and Instruction	9
Educational Administration	15
Counselor Education	23
Speech-Language Pathology and Audiology	28
Rehabilitation and Special Education	32
Physical Education	39
Recreation and Leisure Studies	42
Physical Therapy	44
Interdepartmental Courses	46



Description of Courses

This booklet contains descriptions of courses currently offered by the Graduate School of Boston-Bouvé College of Human Development Professions.

All courses carry four quarter hours of credit unless otherwise indicated. Please see the current schedule for summer, fall, winter, and spring quarter listings.

Foundations of Education

50.801 Educational Anthropology

Examination of schooling as a particular variety of socialization, with special attention to characteristics of societies that rely heavily on formal instruction, contrasted with less deliberately patterned techniques of child rearing. Readings will be mainly cross-cultural, ethnographic, and historical.

50.802 Sociology of Education

The functioning of educational institutions in their social and cultural milieu will be examined from anthropological and sociological perspectives: the school as a social system; influence of the stratification system, youth cultures, and racial antagonisms upon the educational enterprise.

50.803 Child Psychology

A review of the principles of child development from birth to preadolescence. Particular emphasis will be placed on intellectual, social, and emotional development. The theoretical formulations of psychoanalysis, social learning theory, and Piaget will be discussed in the context of relevant research in these areas, as well as their educational implications.

50.804 Adolescent Psychology

Social, emotional, and intellectual development in the adolescent years. Problems in family relationships and in the adolescent's social environment as well as his adjustment in school. Case history material.

50.805 Personality and Social Structure

Human behavior from a combined psychodynamic and sociological point of view, with special emphasis on socialization and the relations between the individual and the collectivity. The integration of relevant theories from psychology, sociology, and anthropology. *Suggested Prep., a course in sociology, cultural anthropology, or social psychology.*

50.806 Psychology of Learning

The basic principles and conditions of acquisition, retention, and transfer of learning. *Suggested Prep., a course in psychology.*

50.807 Abnormal Psychology

A historical overview leads to contemporary views on how human personality becomes disordered and maladaptive. Principal emphasis is on the involvement of psychopathology during the course of development, including a perspective for viewing the economy of psychological deviations. Neuroses, transient states, character disorders, sexual deviations, psychophysiological reactions, drug and alcohol addictions, and psychotic reactions, each with a clinical picture, typical course, and outcomes are considered. Some consideration is devoted to current methods of diagnosis and treatment.

50.808 Seminar in Child Development

A seminar course with emphasis on discussion of child development theories with special reference to personality and cognitive development. Critical evaluation of research related to child development theories with particular emphasis on recent trends, new approaches, and relevance to educational theories and practices. *Prep., a course in child psychology or human development.*

50.809 Seminar in Adolescent Development

A seminar course with emphasis on discussion of major problem areas facing the adolescent in our society. Particular emphasis will be given to social and emotional development. Included will be a survey of research in such areas as psychoanalysis, social learning, morality, and delinquency. *Prep., a course in adolescent psychology or human development.*

50.810 Psychology of Personality

A systematic consideration of the personality theories of Freud, Jung, Adler, Sullivan, Horney, Cattell, Allport, Rogers, and other approaches, including the psycho-

somatic of Alexander and the work of Reich. Theories are considered in depth and examined for ways that contribute to an understanding of dynamic factors in personality formation. Theories and theorists are compared for a greater understanding of strengths and weaknesses. Social, cultural and philosophic questions are discussed. Implications of some of the ideas and theories for the therapeutic process will also be considered. *Suggested Prep., at least one and preferably more courses in psychology.*

50.811 Psychology of Thinking

A consideration of the processes involved in cognitive organization and functioning. Topics will include language, concept formation, and problem solving. *Suggested Prep., a course in psychology.*

50.812 History of Education

An opportunity to explore some of the historical roots of contemporary educational theory and practice with a focus on selected aspects of educational history from antiquity to the present. Also an opportunity to utilize knowledge gained for the development of a personal educational position.

50.814 Nature and Theory of Psychological and Educational Measurement

An examination of the logic of measurement and the nature of human capacities, aptitudes, and abilities. Characteristics of tests, ratings, questionnaires, and similar instruments are reviewed with emphasis on their reliability, validity, and utility. Item analysis procedures and test standardization are covered.

50.815 Research Design in Education

An introduction to scientific methods of research in education and related fields. Stress will be placed on critical reading and understanding of research literature, formulating research hypotheses, constructing a research proposal, and carrying out an individual or group project. This course must be included among the first six

courses taken by each student. *Prep., 50.841 Introduction to Educational Statistics or successful completion of the statistics proficiency examination.* (Students wishing to make arrangements to take the proficiency examination should call 437-3305.)

50.816 Nonquantitative Research Methods in Education

Nonquantitative research methods in the human development professions. Among the topics considered are problem formulation, location and selection of data, authenticity of sources, and analysis of data by synthesis. Case-study approaches and style of writing for research proposals are also discussed. *Prep., 50.842 Intermediate Educational Statistics.*

50.817 Advanced Research Design

This course focuses on methodologies for collecting, interpreting, and evaluating data and deals with biases encountered in the data-collection process. Topics such as data collection and interpretation, use of sampling, analysis of variance, covariance, multiple regression, multivariate procedures, and advanced topics in scaling, semantic differential methodology, questionnaire design, interview methodology, and evaluative criteria will be featured. Students enrolling for this course will design and complete a proposal on this design for the conduct of a research project. This project may be carried out as part of research on either the master's or doctoral level. *Prep. 50.842 Intermediate Educational Statistics or equivalent, or permission of instructor.*

50.818 Comparative Education

Introduction to education in other nations and exploration of its relationships with the political, economic, social, and cultural milieu. Selected countries in Western and Eastern Europe, South America, and Africa will be considered.

50.819 Theories of Developmental Psychology

The major developmental theories and re-

lated research of Havighurst, Erickson, Piaget, and others. *Permission of instructor required.*

50.820 Seminar in Contemporary Issues in American Education

Discussion of selected issues in contemporary American education such as school desegregation, compensatory education, learning problems of the disadvantaged, professionalization of teachers, etc. Review of relevant research and opinions. The topic or topics of the seminar for a particular quarter will be announced in the registration materials distributed in advance of that quarter.

50.821 Sex Roles in Education

This course identifies and examines some of the major issues related to sex roles in both the formal and informal educational systems of our society. Topics that will come under special scrutiny include development of sex role patterns in the home and preschool and through children's books, games, and television programs; life for boys and girls in the elementary and high school classroom; sex bias in counseling and in vocational guidance and training; changes in traditional family roles and occupation hierarchies; assets and liabilities of coeducational and single-sex education. The course may also allow students, in small groups, to explore their own sex role attitudes and the strategies they use to socialize young people.

50.822 Topics in the Philosophy of Education

A study of the basic assumptions underlying statements of educational content, process, and aims. Materials to be subjected to philosophical analysis are selected from educational and philosophic writings according to themes (e.g., authority and freedom, "growth" as an educational objective, the nature of educational relationships). The themes dealt with vary from quarter to quarter, depending on the concerns and interests of students and instructor. Brief lectures, mostly discussion.

50.823 Education and Equality

An investigation into the reciprocal relationship between American educational institutions and the equality-inequality dimension of American social structure. Both the traditional view, which celebrates the American public school as a triumph of equalitarianism, and the revisionist view, which emphasizes inequalitarian consequences of American educational practice, will be discussed.

50.841 Introduction to Educational Statistics

Basic descriptive statistics for measurement and research. Topics include use of statistical notation, measures of central tendency and variability, probability and sampling techniques, theoretical distributions, linear regression and correlation, and an introduction to statistical inference. (This course, or completion of a statistics proficiency examination, is required for admission to 50.815 Research Design in Education.)

50.842 Intermediate Educational Statistics

Statistical inference of normal populations and discrete data; estimation; testing of hypotheses; multiple correlation; analysis of variance and covariance; contingency; the chi-square test and other nonparametric tests. Emphasis is given to application in educational research. *Prep., successful completion of the statistics proficiency examination; satisfactory completion of 50.841 Introduction to Educational Statistics; or permission of instructor.* This course must be completed prior to doctoral candidacy.

50.845-.846 Independent Research Seminars I and II (4 q.h. each)

Focus is on the design, conduct, analysis, and reporting of data from an individual research project. This project may be original or secondary, applied, theoretical, or action research and must be substantially larger in scope than that accommodated by Directed Study. Evaluation will be based on oral and written interim reports in Semi-

nar I and oral and written final reports in Seminar II. This course will serve as an option to the thesis requirement only for students enrolled in the master's degree program in Educational Research.

50.847 Introduction to Computer Programming: FORTRAN

A laboratory course designed to develop facility in the use of a wide range of data-processing equipment in educational research. Students will be introduced to the basic principles of computer programming, but emphasis will be placed on the applicability and use of existing statistical programs.

50.850 Communications Theory

An introduction to communications theory, covering models of the communication process, attitude changes, information, innovation, dissemination and flow, communication modalities, and language processing.

50.853 Adult Psychology

A comprehensive view of the three major areas of adulthood (young adulthood, middle age, and old age) in a context of research findings, academic knowledge, and clinical needs.

50.891 Thesis

A research activity that may be selected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

50.895 Institute in Foundations of Education

(See general institute description on page 48.)

50.898 Workshop in Foundations of Education

(See general workshop description on page 48.)

50.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. Not available to special students. *Prep., approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)*

Curriculum and Instruction

51.802 Procedures of Evaluation

Consideration is given to evaluation as a process for the improvement of learning and instruction. The course concerns itself with such topics as how to measure and evaluate effective, psychomotor, and cognitive dimensions of student growth; test construction; collecting and administering standardized tests; various bases of grading; and methods of reporting student progress.

51.805 Student Teaching with Related Seminar (8 quarter hours)

A University-arranged practicum of observation and teaching in schools offering comprehensive programs within reasonable commuting distance of the University. Participating on a full-time basis, the student is expected to develop planning and communication abilities within his major field. Biweekly seminars at the University provide additional opportunity to analyze theory-practice relationships and to examine generic problems of teaching. *Prep., course in child or adolescent psychology; successful completion of all course work in the nondegree Curriculum and Instruction program.* (Open only to students in the nondegree Curriculum and Instruction program.)

51.825 Seminar in Mathematics Education

Students are expected to analyze a mathematics learning problem, to investigate relevant research, and to prepare materials embodying their own proposed solutions. *Prep., permission of instructor.*

51.842 The English-Language Arts Curriculum

The design and function of the English-language arts curriculum; selected current issues as they impinge upon the English-language arts curriculum; the design and function of research in the English-language arts curriculum. Open to certified or experienced teachers. *Prep., permission of instructor.*

51.843 Literature in the English-Language Arts Curriculum

The historical-social, psychological, personal, archetypal, textual, biographical, and philosophical-moral aspects of literary study and their relation to the chronological, thematic, and generic demands of the literature program; the sources of interest in literature as they relate to the young reader and their implications for the English-language arts curriculum; the interrelatedness of literature and other components of the English-language arts curriculum. Each student will identify and investigate an area of individual interest. *Prep., 51.842 The English-Language Arts Curriculum or permission of instructor.*

51.844 Writing in the English-Language Arts Curriculum

The cognitive and effective bases of imaginative and nonimaginative writing; the role of writing in the relationship between self and object; modes of imaginative and nonimaginative writing appropriate to the young writer; the impulse to expression in the young writer and its implications for the English-language arts curriculum; the interrelatedness of writing and other components of the English-language arts curriculum. Each student will identify and investigate an area of individual interest. *Prep., 51.842 The English-Language Arts Curriculum or permission of instructor.*

51.846 English as a Second Language I

First course in teaching ESL, introducing the basic linguistic, cultural, and psychological concepts. Analysis of current approaches to teaching ESL locally and internationally from the standpoint of diagnosis, grouping, use of particular methods, and materials. Observations of local ongoing ESL programs will be included. *Prep., 51.871 Diagnosis and Remediation of Reading and Language Disabilities I or permission of instructor.*

51.847 English as a Second Language II

Second course in the ESL sequence which emphasizes innovative means in teaching ESL. Specific projects according to student

need and interest will be developed; supervised clinical work. *Prep., 51.846 English as a Second Language I.*

51.848 Language in the English-Language Arts Curriculum

An examination of the multiple dimensions of language study in the English-language arts curriculum; the role of inquiry in the study of language and its implications for the English-language arts curriculum; theories of grammar and their relation to the study of language in the English-language arts curriculum; the interrelatedness of language and the other components of the English-language arts curriculum. Each student will identify and investigate an area of individual interest. *Prep., 51.842 The English-Language Arts Curriculum or permission of instructor.*

51.849 Topics in English-Language Arts Education

An investigation of a matter of immediate concern to English-language arts education, but for which no organized study is ordinarily available. Typical topics include media in the English-language arts program, behavioral objectives in the English-language arts program, the English-language arts program for the disadvantaged. Each year the seminar topic for that year is announced prior to registration.

51.851 Seminar in Current Issues in the Social Studies

A content approach to problems of political, economic, and social significance which have contemporary relevance for teachers of the social sciences.

51.853 History and the Social Studies in the School Curriculum

Permits the student to explore some of the fundamental concepts of anthropology, sociology, economics, political science, and history. Emphasis will be given to the interrelatedness of disciplines and to the extraction of operating principles from those that aid in the analyses of social problems. As a consequence of such anal-

yses, the student should be equipped to find a greater variety of conceptual relationships within the historical social science field. From there a framework for evolving courses of study may be generated. *Prep., teaching experience or certification.*

51.854 Social Science Materials Seminar

A curriculum course wherein the knowledge previously acquired will be used to establish criteria for the selection and development of curriculum materials. All materials of instruction will be viewed as means of implementation of objectives relating to specific social science concepts and skills. An effort will be made to personalize and concretize abstract phenomena and to demonstrate their impact on the quality of human lives. Students will examine and analyze prepared curricula and will be asked to develop original materials that include provision for the integration of a variety of thinking, reading, and social skills. *Prep., teaching experience or certification.*

51.863 Methods and Materials for Teaching Children I

Teaching methods and learning materials used in teaching children in a number of educational settings. This course will help students establish objectives, plan and execute appropriate learning experiences, and evaluate outcomes.

51.864 Methods and Materials for Teaching Children II

A continuation of 51.863. *Prep., 51.863 Methods and Materials for Teaching Children I.*

51.867 Remediation in Mathematics

An effective approach to the teaching of mathematics; diagnosis and remediation of difficulties, alternative teaching methods, techniques for the improvement of student skills and of student attitudes toward mathematics.

51.870 Foundations of Developmental Reading

Reading and writing as the receiving and generating of language; current developmental reading, writing, and related language skills; selected research findings bearing on relevant topics. (This course includes ten hours of observation or other field experience.)

51.871 Diagnosis and Remediation of Reading and Language Disabilities I

Reading and language disabilities; causes and correlates of disability; language differences; aspects of measurement; diagnostic and corrective procedures in reading, writing, and related language skills; selected research findings bearing on relevant topics. *Prep., 51.870 Foundations of Developmental Reading.*

51.872 Literature and Materials Seminar

Literature for children, adolescents, and adults; the sources of interest in literature as they relate to the reader; the interrelatedness of literature and other components of the language arts program; investigation of materials available. Students will develop projects related to their needs and interests.

51.873 Clinical Practicum in Reading

Practicum in clinical experience, tutoring children and adults with severe reading disabilities in the Reading Clinic for a total of seventy hours under close staff supervision. A one-hour seminar follows each tutoring session for purposes of discussion and case presentation. Diagnosis, lesson plans, daily logs, complete case history, and final progress evaluation are required of each student. *Prep., 51.870 Foundations of Developmental Reading.*

51.874 Diagnosis and Remediation of Reading and Language Disabilities II

Second course in Reading and Language Disabilities, including an examination of selected models of language processes; cognitive and effective dimensions; problems in language pathology; and other learning disabilities, including academic, percep-

tual-motor, and neurological areas. *Prep.*, 51.871 *Diagnosis and Remediation of Reading and Language Disabilities I* and 51.873 *Clinical Practicum in Reading*.

51.875 Field Practicum in Reading

Eighty-hour field practicum offers students the opportunity to apply consulting and remediation skills in a school setting. Students may consult with teachers on the implementation of developmental and corrective reading and on reading in the content areas and also may provide diagnostic and remediation to pupils having special needs in reading. *Prep.*, 51.871 *Diagnosis and Remediation of Reading and Language Disabilities I* and 51.873 *Clinical Practicum in Reading*.

51.876 Teaching Reading in Junior and Senior High School

Developmental or corrective reading programs at the secondary level. Development of reading rate, comprehension, interpretation, and study skills in the content areas.

51.877 Language and Reading

Introductory course in linguistics with emphasis on implications for reading and language instruction. Topics include the nature of language, introduction to the development of syntax, phonology and semantics, English orthography, the grammar of child language, and dialectology. *Prep.*, 51.870 *Foundations of Developmental Reading or consent of instructor*.

51.878 Current Issues in Reading and Language

Three or four topics of current interest in reading and language education are investigated in depth over a three- or four-week period each during the quarter. Typical topics might include lectures and readings on sexism in reading materials, Chapter 766 and its implications for reading and language education, "back to basics," reading and language in the open and alternative education program, problems of illiteracy, bilingual and bicultural education and reading/language instruction.

51.879 Bilingual Education, Methods, and Materials

An introductory course in the problems, programs, and principles of bilingual/bicultural education. Emphasis will be on the current methods and materials used in programs nationally and internationally. Curricular aspects of bilingual/bicultural programs will be studied, as well as available research. *Prep.*, 20.825 *Language and Communication*, 30.120 *Introduction to Linguistics*, 30.807 *Language and Its Structure*, 51.877 *Language and Reading*, or 55.873 *Social Dialectology*.

51.880 The Evolution of Curriculum Theory and Practice

Examination from a historical perspective of the curriculum of the American school as an evolutionary process resulting in part from conflict between subject-oriented and student-oriented curricula, traditionalists and revisionists, behaviorism and psychodynamism, and the interplay of forces generated by students, teachers, administrators, and other interested groups. Present curricula will be analyzed as the outcomes of such influences and trends for future developments will be hypothesized. Hence, the course will also focus on the process of curriculum development and the product of that development.

51.881 Seminar in Curriculum: Alternative Designs

Identification and analysis of problems in curriculum and instruction in light of the forces affecting the curriculum within the student's area of specialization; design and implementation of solutions to such problems; evaluation and field testing, where feasible, of these solutions. *Prep.*, 51.880 *The Evolution of Curriculum Theory and Practice*.

51.882 Seminar in Instruction: Alternative Designs

Methods of inventing or adapting methods of teaching to make them appropriate to the demands of the curriculum, the needs of the students, the capabilities of the teachers, the expectations of the commu-

nity and the resources of the school or college. This course will help the student identify the criteria by which instructional practices may be selected, by which they may be evaluated, and by which they may be developed. Instructional practices include methods of teaching, designing learning materials, grouping students, pacing, scheduling, and evaluating. Students will have the opportunity to revise existing resources and to create new resources for instruction in order to make the implementation of a specific curriculum more effective. *Prep. (except for students in joint programs with a department in another college), 51.881 Seminar in Curriculum: Alternative Designs (may be taken concurrently); prep. for students in joint programs with a department in another college is 51.901 Analysis of the Instructional Process or equivalent.*

51.883–.884 Seminar in the State of the Art and Field Project (8 q.h.)

Students will examine the current curricular and instructional issues in specific teaching areas or levels, hypothesizing and projecting possible future directions in curriculum and instruction in these areas; integration of the results of these inquiries into coherent understandings of the state of the art in these areas and the development of a special project to be implemented by the students within the context of their own teaching experiences. Seminars will be held over a period of two quarters every other week. *Prep., teaching experience.*

51.889 Urban Education: An

Introduction to Teaching in City Schools
An introductory course offering students an overview of urban education, especially in the public schools. The demography of city schools is studied as a basis for identifying diverse special education needs of the multicultural population, such as ESL, bilingual education, and ESD. Study includes an overview and investigation of current curricular patterns related to this

area of education. Readings, guest speakers, and first-hand observations of selected schools and programs are included in the course content.

51.891 Thesis

A research activity that may be elected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

51.893–.894 Seminar in Supervision of Instruction and Practicum (8 q.h.)

Students apply the skills learned in the seminar to a field setting. Student field work is supervised by an on-site person and a professor. At periodic seminars projects are selected and discussed. Students plan the projects and implement these in the field. Students also plan and carry out a project evaluation. (Must be taken in consecutive quarters.)

51.895 Institute in Elementary Education

(See general institute description on page 48.)

51.896 Institute in Secondary Education

(See general institute description on page 48.)

51.897 Workshop in Elementary Education

(See general workshop description on page 48.)

51.898 Workshop in Secondary Education

(See general workshop description on page 48.)

51.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep., approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)*

51.901 Analysis of the Instructional Process

A consideration of the rational basis for effective teaching and the nature of the educational process. Learning theory is related to the various strategies and activities that can be implemented within a learning situation to meet the needs of the learners, including those with special needs. Alternative approaches, research results, and theoretical constructs are employed to help extend the prospective teacher's concepts of the educational process and the role of the teacher in it.

51.902 Fundamentals of Curriculum Development

An examination of how goals and objectives are selected and how priorities are determined. Methods of designing educational programs to meet specified goals and methods of evaluating educational outcomes in terms of the goals of the program and techniques for modifying programs in the light of such performance.

51.903 Methods and Materials for Teaching Adolescents and Adults I

Consideration of specific methods and materials appropriate to teaching adolescents and adults to develop in the students an understanding of the complexities of the materials and methodology of the teaching-learning process, to encourage within students attitudes conducive to and identified with good tenets of teaching, and to foster in the students acceptance of the need to grow constantly and to be aware of the continuing development of our knowledge of the learning-teaching process.

51.904 Methods and Materials for Teaching Adolescents and Adults II

This course provides for the specific subject areas to be attended to. Topics covered include techniques of organizing and presenting lessons, developing teaching materials, using audiovisual equipment, developing and implementing evaluation

instruments, and selecting appropriate materials within each field of interest. (15 hours of field work required.)

51.920 Methods and Materials in Adult Literacy

This course will introduce students to some current diagnostic and instructional approaches to the functionally and totally illiterate adult. Current methods and materials will be analyzed and evaluated. Special projects may include the development of informal diagnostic instruments and/or instructional materials for particular adult learners. An overview of national and world literacy problems and programs will also be offered.

51.926 Teaching Adults: Methods and Materials

Designed to help prepare participants to instruct adults in a variety of academic and nonacademic settings, the course emphasizes the skills and knowledge necessary to identify objectives, plan and execute appropriate lesson plans in keeping with students' requirements, develop curricula in a variety of settings, and evaluate students' performance. Class activities include the presentation of both theory and application through selected case studies that exemplify adult teaching in different environments. Participants also have the opportunity to acquire the necessary skills for developing individual models of adult teaching behavior to suit various circumstances.

51.930 Selection and Utilization of Instructional Material

This course deals with all aspects of instructional media, surveying types, techniques, advantages, limitations, sources, and methods of using materials and equipment in specified areas. Emphasis is on the selection of appropriate media (print and nonprint) to suit given learning objectives. Laboratory experience in operation of equipment and the production of instructional materials is provided.

51.931 Developing Multimedia Learning Packages

During this course each student will produce a multimedia (print and nonprint) instructional package for individualized learning.

51.940 Principles of Programmed Instruction

The development and current status of self-instructional devices. A survey of available programs and teaching machines, including audiovisual machines, with emphasis on the details of the construction and evaluation of programs.

51.941 Teaching Reading to the Deaf

Modern methods in use, such as the Fitzgerald Key and the Natural Language Approach. Emphasis is on using language in natural situations through lip reading and writing, with later emphasis on the formal presentation of language principles. Methods used to develop reading experiences that focus on content rather than mechanics are also covered as well as considerations appropriate to the development of a balanced reading program that provides adequate motivation, a wide variety of rich materials, a well-organized sequence of reading experiences, and provisions for evaluation.

Educational Administration

52.805 Simulated Problems: Secondary School Administration

The course is designed to place each student in a simulated decision-making situation as a principal or administrator of a secondary school. Background materials have been prepared which describe all aspects of a school system, including its publics, its policies, its certified and noncertified staff members, and its geographical and socioeconomic makeup. These background data may be disseminated through motion pictures, film strips, and taped interviews with influential people in the community, as well as through written materials. *Prep., 52.810, 52.811, or permission of instructor.*

52.806 Directed Field Experiences in the Administration of the Elementary School

Required of all master's candidates who major in school administration. Study and discussion of administrative functions may be coordinated with selected field trips to administrative settings and with guest lectures by practicing elementary school administrators. These experiences usually involve visits to such settings as an elementary school, a middle school, a superintendent's office, a school committee meeting, and appropriate federal and state agencies. In addition, each student will be expected to participate in an administrative field experience in an elementary setting for a minimum of four hours per week. *Prep., 52.810 or permission of instructor.*

52.807 Directed Field Experiences in the Administration of the Secondary School

A companion course to 52.806, required of all master's candidates in school administration. Study and discussion of administrative functions may be coordinated with selected field trips to administrative settings and with guest lectures by practicing secondary school administrators. These experiences are aimed at educational agencies at the secondary level and may include visits to a comprehensive high

school, a junior high school, a regional vocational-technical school, a superintendent's office, a school committee meeting, and appropriate federal and state agencies. In addition, each student will be required to participate in an administrative field experience in a secondary school for a minimum of four hours each week. *Prep., 52.810 or permission of instructor.* (52.807 may be a continuation of 52.806 or may precede it.)

52.808 Seminar in Educational Administration

A culminating experience for students majoring in school administration at the master's level. The student is confronted with major issues facing the school and its administrators. Emphasis is placed upon applying knowledge gained in previous administrative courses to an understanding of contemporary education problems. *Prep., 52.810, 52.811, or permission of instructor.*

52.810 Leadership in Education, Part I

Part I of a two-term core course designed to introduce the student to concepts of formal organization. This core, consisting of a two-part sequence, is prerequisite to further study in the Department of Educational Administration. Part I may provide the student with an overview of formal organizations as social systems, with emphasis given to the leadership function. Relationships between individuals and organizations are considered. Communications and decision-making functions are analyzed and examined.

52.811 Leadership in Education, Part II

Part II continues an emphasis on the leadership function in organizations. It examines selected informal organization elements such as motivation, normative order, social power, conflict, conformity, and creativity. Attention is given to processes of change and innovation in organizations. *Prep., 52.810 must be completed before enrollment in 52.811.*

52.813 Instructional Leadership: Curriculum Development and Supervision

This course views the responsibilities of administrative personnel relating to the improvement of curricular and instructional practices. Evaluative techniques, in-service education, supervisory procedures, and innovative programs are among the areas of consideration. Students may have the opportunity to become engaged in supervisory projects individually or in small teams. *Prep., 52.810 and 52.811, or permission of instructor.*

52.814 Simulated Problems: Elementary School Administration

The course is designed to place each student in a simulated decision-making situation as a principal or administrator of an elementary school. Background materials have been prepared which describe all aspects of a school system, including its publics, its policies, its certified and noncertified staff members, and its geographical and socioeconomic makeup. These background data may be disseminated through motion pictures, film strips, and taped interviews with influential people in the community, as well as through written materials. *Prep., 52.810, 52.811, or permission of instructor.*

52.815 Simulated Problems: Administration of Occupational and Career Education

Each student is confronted with a series of simulated decision-making situations such as those which are usually faced by administrators of programs in the area of occupational and career education. Readings, audiovisual material, and class interactions constitute the design of this course.

52.816 Seminar in Occupational and Career Education

Students will be confronted with a sampling of the major issues facing administrators and supervisors of occupational and career education programs in their efforts to organize, promote, and operate such programs. Emphasis will be placed on applying the knowledge acquired in previous

courses and other program experiences to arrive at an understanding of contemporary occupational and career education problems and their solutions.

52.824 Administration of Cooperative Education

An examination of significant elements in the planning, implementation, and operation of a cooperative education program. Areas of concern include agents for institutional change, intra-institutional relationships, program costs and funding sources, cooperative education calendars, development of cooperative work assignments, relationships with cooperative employers, and operational policies.

52.826 Administration of the Elementary School

A survey of the operational tasks performed by the elementary school administrator. Included will be school-community relations, student personnel, staff personnel, curriculum and instruction, physical facilities, finance and business management, and organizational structure. *Prep., 52.810, 52.811, or permission of instructor.*

52.827 Administration of the Secondary School

A survey of the operational tasks performed by the secondary school administrator. Included will be school-community relations, student personnel, staff personnel, curriculum and instruction, physical facilities, finance and business management, and organizational structure. *Prep., 52.810, 52.811, or permission of instructor.*

52.828 Administration of Early Childhood Education

This course will include the study of significant elements of administration unique to the planning, implementation, and operation of an early childhood education center. Areas of concern are funding sources, intra-institutional relationships, patterns for designing early childhood programs, on-site visitations, modes of private

governance, use of plant, student and teacher placement, role of volunteers, and related topics. *Prep., 52.810 and 52.811.*

52.891 Thesis

A research activity that may be selected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

52.895 Institute in Educational Administration

(See general institute description on page 48.)

52.898 Workshop in Administration

(See general workshop description on page 48.)

52.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep., approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)*

CAGS and Doctoral Course Offerings in Educational Administration

(Open only to CAGS and doctoral degree candidates or by special permission of the Department Chairperson, granted prior to registration.)

52.830 Current Issues in Educational Administration

A seminar required of all students pursuing the CAGS. Critical and contemporary issues which face administrators will be examined. The status of the administrator; federal, state, and local revenue sources; accountability; teacher militancy; equal educational opportunity; control of schools; and urban education problems are examples of topics that will be analyzed.

52.831 Innovation and Change

A course required of all students pursuing the CAGS. Major emphasis is upon administrative strategies in effecting structural alterations, curricular organization, and instructional techniques. The nature of these alterations varies with the particular problems relevant to the issues that receive consideration.

52.832 The Process of Administration

A course required of all students pursuing the CAGS. Case analysis and group activity will be utilized to gain insight into such areas as the improvement of organizational morale, professional job satisfaction, and current issues of involvement and conflict. Students will also examine alternative courses of action to cope with problematical events confronting educational administrators.

52.833 Research and Statistical Methods for Administrators

A study of the application of the methods of research and statistical techniques to problem solving, with specific focus on the role of research in the administrative decision-making process. The course of study may also focus on the various research designs administrators may use in their positions, such as the development of a

program proposal for local, state, or federal agencies. A specific topic of practical significance in administration is to be selected by the student and a design for studying the topical problem developed. Research relevant to the topic is evaluated. *Recommended prep., rudimentary knowledge of research designs and techniques and an elementary knowledge of basic statistical methods.*

52.834 Educational Finance

The study of school finance deals with the principles and problems of financing education, and also considers the basic concepts of economics relative to the place of school finance in the field of public finance. The sources and rationale for public support of schools are examined. Selected state and federal aid programs, capital outlay programs, current practices and issues of local support, and bond issue campaigns are included in this study.

52.835 School Business Management

Practices and issues in the administration of school business affairs are the major concerns of the course. The role of the school business administrator and the educational budget will be examined. Attention will be paid to principles of budget preparation and development, purchasing, supply management and distribution, school accounting and data-processing systems, auditing, financial reporting and management of payroll, transportation programs, and school food services, and the operation and maintenance programs for the physical plants. In addition, each student will be placed in a simulated decision-making situation. Background materials have been prepared describing aspects of a fictitious school system, including its publics, policies, and other relevant information. Each student may have the opportunity to deal with matters typically faced by the school business administrator.

52.836 Personnel Administration

The purposes, patterns, and issues in personnel administration are the major considerations of the course. Study will

include the skills, attitudes, and knowledge which an institutional staff needs to have and which are essential to the accomplishments of organizational goals. Personnel administration programs and problems will serve as the focus for the course.

52.837 School-Community Relations

This course includes the study and design of school-community relations programs based on the principles and practices of the intercommunications between the school and its several publics. Selected research findings relative to public relations programs in business, industry, and governmental agencies will be reviewed in addition to those involving educational systems. Stress will be placed on the role of the administrator in the development of a comprehensive program of school-community relations to the administrative unit.

52.838 School Plant Planning, Operation, and Maintenance

This course seeks to have the student develop a basic understanding of the processes involved in the planning, maintenance, and operation of school plants. Such items as educational specifications, the process of school construction, techniques used to provide clean, safe, and healthy environments for the teaching-learning process, along with the selection, assignment and supervision of custodial and maintenance staff will be involved. Statutes or regulations pertaining to these processes used by state and local regulatory bodies will also be reviewed. Consideration will be given to issues related to declining enrollments and school closings.

52.843 Administrative Internship

This is an individualized offering involving supervised observations, internships, externships, and seminars in educational administration. It is designed to provide further practical experience in the student's area of administrative preparation. The administrative internship program must be worked out with the adviser not later

than the end of the second week of the quarter preceding the quarter during which the internship will take place.

52.844 School Law

The student will be expected to develop a basic understanding of federal and state laws that apply to school systems, educational programs, and personnel, as well as of the legal prerogatives available to the practicing administrator and the local boards of education. This study will include consideration of the constitutional, statutory, and common-law foundations of educational systems and the school administrator's role with respect to them.

52.848 Special Education Administrative Internship

An individualized offering for students preparing for administrative roles in areas of special education. The course offers experiences in supervised observations, internships, externships, and seminars in special education administration. The administrative internship program must be worked out with the student's adviser not later than the end of the second week of the quarter preceding that in which the internship is to take place.

52.850, .851, .852 Doctoral Seminar in Leadership: Administration and Supervision I, II, III

A series of three seminars required of all students pursuing the Ed.D. degree. The dialogues in these courses will use an interdisciplinary approach to explore complex behavioral and structural interactions found in formal organizations. Major emphasis will be placed upon integrating theoretical concerns with practical administrative functioning.

This sequence of seminars is viewed primarily as a pooling of the results of extensive individual student research and activities and is aimed at giving the student an overview of all aspects of the institution he or she will be leading. (These seminars open only to students who have been accepted to a doctoral program.)

52.854 Organizational Analysis

Open only to advanced graduate students, this course will include examination of different approaches used to define traits or characteristics of formal organization. Special emphasis will be placed on the application of models, typologies, and schemes to identify structural or procedural deficiencies in bureaucratic social systems.

Prep., permission of instructor.

52.860 Academic Administration in Higher Education

Recruitment of properly qualified faculty and staff is only one problem of the academic administrator. This course will also consider the problems of pupil services, admissions, athletics, curriculum development, accreditation, instructional resources, registration and scheduling, faculty organization, continuing education, faculty rights and responsibilities, and personnel policies.

52.861 Problems in College

Administration: A Simulated Experience

This seminar is designed to place each student in simulated decision-making situations as an administrator of a college or junior college. Background materials have been prepared which describe many aspects of a college, including its policies, the makeup of its faculty and student body, its financial situation, the community it serves, and its board of control.

Prep., 52.863 Financial Management in Higher Education or permission of instructor.

52.862 Institutional Planning and Facilities

This course will consider the planning of new colleges as well as the expansion and maintenance of existing ones. Systems analysis, needs surveys, and development of educational specifications for college facilities will constitute half of the course. The other half will involve studying the operation and maintenance of the physical plant, including provisions for housing, safety, parking, communications, and health service.

52.863 Financial Management in Higher Education

This course seeks to combine a knowledge of fund-raising activities with the study of proper financial management in higher educational institutions. The problems of fund raising for both public and private, two- and four-year institutions will be considered. Modern techniques of budget preparation and control may include purchasing, school accounting, data processing, providing benefits for faculty, financial reporting, food services, housing, and operation and maintenance of the physical plant.

52.864 Typologies of Higher Education

A study of the types of higher educational institutions, with emphasis on organizational structure, modes of governance, and administration. The history of higher education, particularly the development of colleges, universities, and junior colleges in the United States, will be considered to provide perspective for the modern college administrator. Important issues and the problems they present for administrators will provide the major focus of this course.

52.865 Systems Theory in Education

This course is required of all students pursuing the CAGS. The course provides the student with an introduction to general systems concepts and terminology as well as the implications of systems theory to leadership and administration. Topics include systems applications such as input/output analysis, PERT, feedback monitoring and response, flowchart logic, and the computer as a system. Consideration is given to systems study as a method of planning and evaluation.

52.866 Politics and Educational Decision Making

This course examines federal, state, and local governmental arrangements and political processes which influence educational policies of school systems. Emphasis is given to the application of political science concepts and research methods to educa-

tional policy-making processes and to the political environment surrounding the educational administrator.

52.867 Administration of Adult and Continuing Education

The historical development of adult and part-time education, with attention to the present status and trends for the future, will be studied, with emphasis on the administration of these programs. A variety of adult educational programs in schools, colleges, junior colleges, religious agencies, social service organizations, business and industry, and professional organizations will be included, focusing on planning, implementing, administering, financing, and evaluating such programs.

52.868 Administration of Two-Year Colleges

Emergence of the community college movement in the United States, administrative structures and governance, the role of faculty in planning, the student population and related student personnel services will be examined. Particular emphasis is placed upon the identification and utilization of community resources in curriculum development and the college's total relationships with the community in which it exists. The two-year technical institute and both publicly and privately supported junior colleges will be studied. Field visits are an integral part of course requirements.

52.869 Problems in Urban School Administration

This course examines the problems of educational administration in the complex city school system with emphasis on solutions to educational problems caused by the unique demographic characteristics of the city.

52.870 Securing and Administering Grants in Education

This course is designed to provide school administrators with knowledge of fund raising for educational purposes and supervisory techniques for funded programs.

Designed as a systems approach to grantsmanship, the course will emphasize the methods and techniques of fund raising, program planning, and proposal writing.

52.874 Collective Negotiations in Education

This course is designed to provide prospective administrators and those already engaged in administration with knowledge of the collective negotiation process and collective negotiation strategies and tactics. Designed as a systems approach to collective negotiations, simulation exercises and cases will be used to provide practical exercises for students. When arrangements can be made, guest lecturers experienced in collective negotiations will be invited to the seminar.

52.875 Administration and Supervision of Special Education

Designed for advanced graduate students preparing for administrative or supervisory positions in special education programs. Facilities and curriculum adjustments, staff roles, methods and content for in-service training, and the use of the team approach are studied. Field trips to observe and evaluate programs may be required.

52.876 Administrative Use of Microcomputers

This course is designed for educators with minimal computer experience. It offers a survey and analysis of currently available microcomputers with a methodology for selecting and using an appropriate one. Considerable time is given to building and processing data files and using the output in a variety of administrative task and process areas.

52.877 Human Relations Skills for Administrators

This course offers students the opportunity to examine methods of diagnosing problems and responding in management contexts; analyzing the norms, influence patterns, roles, and control systems of organizations; performing some of the critical skills required in the leadership of

human organizations; and managing an intervention for the purpose of solving an organizational problem. *Prep., 56.832 Group Dynamics or equivalent.*

52.878 The Administrator's Role in Supervision and Evaluation

The course examines the leadership role as it relates to supervision and evaluation. Through role playing, case analysis, and the use of videotapes, students have the opportunity to engage in activities typically required of building or unit administrators. A variety of supervisory and evaluation techniques and formats appropriate to both formative and summative evaluations are presented for examination.

52.879 Program Planning and Workshop Design

Administrators who wish to be effective must know the techniques for directing client-needs assessment. This course presents a variety of strategies designed to help students develop skill at assessing client needs, followed by discussions regarding ways in which these needs are translated into program/workshop objectives. The administrator's role in program and workshop design, with emphasis on managing the learning activities, is demonstrated through student involvement in administrative activities. Attention is devoted to the variety of settings in which adult-education administrators work, including educational institutions, business and industry, governmental agencies, and human-service organizations.

52.893 Doctoral Dissertation

Prep., admission to candidacy in the Doctor of Education degree program.

52.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep., approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)*

Computer Courses

See page 46 for descriptions of 66.887 Introduction to Computer Use for Professionals, 66.888 Computer Applications for Professionals I, and 66.889 Computer Applications for Professionals II.

Counselor Education

53.800 Philosophical Foundations of Guidance and Human Services

The purpose of this course is to provide a philosophical and theoretical background for beginning graduate students in counseling. The course has three objectives: 1) to sharpen the "self as instrument" through study and discussion of established theories of helping related to one's personal value system and through self-exploration and increased self-understanding in heretofore unexplored personal areas; 2) to introduce students to the broad spectrum of professional helping service areas with the intent of clarifying the students' professional roles; and 3) to begin to promote the development of a professional identity as a psychological helping professional.

53.801 Tests and Test Procedures

The principles and problems of psychological testing as applied to the work of the counselor are discussed. Consideration is given to technical concepts applicable to the use, understanding, and interpretation of test scores. Students have the opportunity to become familiar with the most frequently used tests of intelligence, aptitude, achievement, interest, and personality. Tests are evaluated for use in diagnosis and in understanding human behavior, with emphasis on their interpretation.

53.802 Vocational Development and Occupational Information

A dual-emphasis course dealing, first, with theories about the ways in which individuals make decisions concerning their choice of vocation; and second, with the kind of data which are needed to assist people with these decisions. These requisite data deal with the relationship of social and economic change to occupational trends, the classification and description of occupational fields, methods of collecting, evaluating, filing, and disseminating vocational information, and the role of the counselor in fulfilling these functions.

53.804 Counseling Theory and Process

A required course for all Counselor Education degree candidates which must be taken in the fall quarter, concurrently with the beginning of Practicum. The course will provide the student with a basic cognitive understanding of several major theoretical approaches to counseling. Classroom content will help students to become familiar with a wide range of individual counseling strategies, to develop listening, understanding, and communications skills, and to further probe their own self-understanding as counselors. These skills and understandings will be discussed and simulated in the context of a variety of settings with a variety of clients. Role playing, case material, and audio and video materials will be utilized in the instruction. This course will not be open to special students, but may be selected by degree candidates in other departments in any quarter except the fall quarter.

53.805--806 Counseling Practicum I and II

The counseling practicum is a supervised counseling experience extending over the academic year. Although registration for this course occurs only during the winter and spring quarters, students will actually begin their practicum in the fall quarter. Emphasis in the fall will be on small-group seminars dealing with counseling and other related matters. The winter and spring quarters will concentrate on the supervised counseling assignment. Assignment to practicum settings will be made according to the student's major area of concentration. Students must make themselves available a minimum of two days per week during the academic year (October to June) for placement in a field setting. Seminars will stress material germane to the student's major and will meet a total of twenty-four times during the year. 53.805 must be successfully completed prior to commencing 53.806. (For administrative purposes, these practicum course numbers will apply to each of the following specific practicum placements: School Practicum (N-9, 5-12), Community Mental Health,

Career/Industrial, Student Personnel/College Practicums.)

Part-time students must submit an application for practicum (available from the Department) by April 1, for approval to enroll in the practicum the following fall quarter. *Prep., 53.800 Philosophical Foundations of Guidance and Human Services and 53.804 Counseling Theory and Process, both of which may be taken concurrently with the beginning of practicum.*

53.808 Group Counseling

An introduction to theory, principles, and techniques of counseling with groups of individuals at different levels of development and for varying purposes. A basic mode of approach may be to involve students in a genuine group counseling experience in order to understand the phenomenon of group experience. *Prep., 53.804 Counseling Theory and Process.*

53.809 The College Student and the Campus

The relationship between college students' behavior and their environment is examined, with focus on students' rights, their social-emotional developmental concerns, and their search for identity. The impact of societal forces and nontraditional patterns of learning on college curriculum options is examined, and varying concerns of personnel services in different types of college climates, including the community college, are discussed. Current issues in higher education are examined as they relate to services offered to students.

53.811 Family and Parent Counseling

The focus of this course is on a conceptual understanding of family systems theory and its application to and implications for family counseling. Structural, communicative, and strategic approaches to marital, parent, and family counseling are presented as the family is studied as an interactional system, as a seedbed of distress and health. Students have the opportunity to become familiar with family assessment, counseling skills, and strategies. *Prep., 53.804 Counseling Theory and Process*

53.812 Seminar in Student Personnel Work

Relevant topics and cases for personnel workers and administrators in higher education will be discussed and studied in depth. Particular emphasis is placed upon the development of student personnel programs, budget planning and development, and staff relationships. The expertise of appropriate specialists is utilized.

53.813 School Counseling Strategies

Intended primarily for students who will counsel in school settings or other settings emphasizing work with children and adolescents. A broad range of approaches will be considered, including, but not limited to, behavior modification, Gestalt, and Adlerian strategies. Special emphasis will be placed on the development of strategies designed to help alleviate typical school-related and developmental problems such as nonachievement, decision making, negative self-identity, and disruptive behavior. Consideration will also be given to the counselor's role as a consultant to teachers, parents, and administrators in effecting positive behavior change. *Prep., 53.804 Counseling Theory and Process.*

53.814 Vocational Counseling Strategies

The individual's role expectations in the world of work will be examined from a human development perspective, and a systematic program to foster self-awareness will be set forth. Vocational counseling is viewed as dealing with the entire individual, including his or her values, underlying psychological needs and drives, and the influence of the environment on his or her level of development and career awareness. Other topics to be developed in this course will include counseling with females and nonachievers, the decline of the work ethic, community resource development, job placement, and information giving as a perceptual process. The course is intended for a variety of client populations from adolescence through adulthood. *Prep., 53.804 Counseling Theory and Process.*

53.815 Rehabilitation Counseling Strategies

Primary emphasis will be on the roles and functions of the rehabilitation counselor, relevant issues in the field, and an overview of the rehabilitation process. Special problems and techniques of counseling with the disabled (physical, mental, and behavioral disorders) will be examined through case studies and role playing. Discussion will also cover disability in the context of social deviance and psychosocial approaches to understanding human behavior, including self-concept, social role theories, and rational-behavioral approaches. *Prep., 53.804 Counseling Theory and Process. (This prerequisite is waived for Rehabilitation Administration majors.)*

53.816 Psychological Counseling Strategies

Focuses on a variety of strategies designed to alleviate problems of older adolescents and adults. Developmental and perceptual Gestalt insight approaches and behavioral approaches to counseling will be analyzed for their effectiveness with a variety of psychological problems. This course is primarily intended for the student working with client populations in mental health settings and college counseling centers. *Prep., 53.804 Counseling Theory and Process.*

53.818 Case Studies in Marriage and Family Counseling

An advanced-level course for students with previous experience or preparation in marriage and family counseling. Skills to be emphasized may include 1) the preparation of case studies of family and marriage histories and current functioning; 2) the design of service, counseling, and referral programs based upon comprehensive studies of needs and resources; and 3) the practice of counseling strategies through role playing, taped interviews, and progress reports of current counseling activities. *Prep., 53.811 Family and Parent Counseling.*

53.820 Seminar in School Psychology

This course provides an intensive analysis of philosophical, technical, and school administrative issues contributing to the professional identity and consultative function of the psychologist in an educational milieu. Simulations, case studies, and research projects will be used to study these issues. *Prep., permission of instructor.*

53.821 Psychoeducational Prescriptions

Recommended for all school counseling majors and required of all school psychology majors, this course will provide training and supervision in synthesizing data on a student's cognitive, affective, and interpersonal needs with educational plans which 1) are based directly on that data, 2) may be implemented in the school setting, and 3) meet the 766, PL 94-142 criteria for such plans. *Prep., permission of instructor.*

53.824 Individual Intelligence Testing (6 q.h.)

Preparation to administer, score, and interpret the Stanford-Binet Intelligence Test, the Wechsler Adult Intelligence Test, and the Wechsler Intelligence Scale for Children. Consideration will be given to the theories of intelligence upon which the tests are based and the use of the tests in educational and clinic settings. Students will be required to administer and score thirty tests, including some from each of the three tests included in the course. *Prep., 53.801 Tests and Test Procedures.*

53.830 Seminar in Contemporary Issues in Counseling

Intensive study of a selected topic in counseling such as counseling minorities, current research, sex counseling, transactional analysis theory and practice, and behavioral counseling. Course objectives will vary according to the topic but may include a review of the literature, skill-building workshop, and action projects. *Prep., 53.834 Advanced Theories of Behavior Change and/or permission of instructor.*

53.831 Advanced Group Counseling

This course will be a continuation of the content presented in Group Counseling, placing greater emphasis on developing skill in conducting group counseling at a variety of age levels. Greater attention will be given to relevant readings and research on group process and methods for behavior modification. *Prep., 53.808 Group Counseling.*

53.833 Seminar in Counseling Supervision and In-Service Education

Theory and practice of the supervisory process as it applies to the evaluation of counselor effectiveness and professional development. Theory readings, discussions, role playing, and a written plan for in-service staff development are course requirements, but the major activity of the course involves the use of audio and videotapes of actual supervisory sessions conducted by class members. *Prep., master's degree in guidance or permission of the instructor.*

53.834 Advanced Theories of Behavior Change I

An advanced-level counseling course required of all CAGS students and designed to provide greater depth of cognitive understanding of three major approaches to therapeutic practice, i.e., the behavioral, depth psychological, and general systems viewpoints. Original readings from selected principal theorists will be required. The course will compare assumptions, goals, and strategies of the theorists studied in order to build a strong conceptual basis for a counseling eclecticism from these analyses. Some of the theorists studied may include Skinner, Wolpe, Bandura, von Bertalanffy, Adler, Jung, and Rank. *Prep., at least two counseling courses emphasizing both theory and process.*

53.836 Psychodiagnosis with Children and Adolescents

This is an advanced-level course in the theory and practice of ego functioning in children and adolescents. Heavy emphasis is placed on the case-study method. A ma-

jor goal of the course will be to conduct a psychological assessment and report the findings of this assessment in terms of cognitive, perceptual-motor, affective, conative, and social functioning. Students will become familiar with several methods of gathering assessment data. *Prep., 53.801 Tests and Test Procedures and 53.824 Individual Intelligence Testing.*

53.837 Advanced Psychodiagnosis with Children and Adolescents

This is an advanced-level course providing intensive supervision in the clinical assessment of ego functioning in children and adolescents. A rudimentary knowledge of the theory and practice of psychodiagnosis is assumed. This course will enable students to receive supervision on clinical evaluations on which they are working. A heavy emphasis will be placed on integrating data from a variety of sources and making in-depth interpretations and appropriate recommendations. *Prep., 53.836 Psychodiagnosis with Children and Adolescents.*

53.838 Psychodiagnostic Measures

This is an advanced-level course in the clinical assessment of adults. The course places heavy emphasis on differential diagnosis and personality description using data from a variety of sources—interviewing, case histories, and objective and projective testing. Some of the tests typically studied in this course may include the California Psychological Inventory, Minnesota Multiphasic Personality Inventory, Bender-Gestalt and Sentence Completion Tests, Wechsler Adult Intelligence Scale, and Draw-A-Person Test. Students will be required to administer and interpret psychological test data and to report their findings in a psychological report. *Prep., 53.801 Tests and Test Procedures.*

53.840–.841 Advanced Fieldwork (8 q.h.)

Required of all CAGS students. Students may be assigned a fieldwork placement consistent with their major professional goals and/or the settings in which they in-

tend to work. The activity of the fieldwork may extend across the academic year from September to June and require a minimum of one and a half days per week, or the equivalent, in the fieldwork setting. Seminars will meet, subject to change, on alternate weeks with additional individual supervision on campus. Supervision will also be provided in the field setting. Both quarters must be completed before credit will be given for the course. *Prep., Counseling Practicum or the equivalent in experience.*

53.845–.846 School Psychology Fieldwork I and II (8 q.h.)

The first phase of a two-year sequence of supervised fieldwork required for school psychologist certification. Students are assigned a placement in an N-12 school system working under the supervision of a certified school psychologist. The activity of the fieldwork will extend for two days a week across the academic year from September to June. Students perform psychological evaluations and participate in other appropriate activities. Seminars meet for twenty-four sessions during the year to provide skill training and discuss role functions. Students receive one hour of supervision per week from the field site supervisor. Students must submit an application for a fieldwork placement by April 1 for approval for the course which begins in the following fall quarter.

53.847–.848 School Psychology Fieldwork III, IV (8 q.h.)

The second phase of a two-year sequence leading to eligibility for application for school psychologist certification. The student will be assigned typically to a different N-12 grade placement than the first experience to provide a diversified experience. The placement is for two days per week from September to June. Seminars meet twenty-four times across the academic year and consist of case presentations, skill and strategy training, and discussions of case management. Students work under and receive one hour of supervision from their certified school psycholo-

gist site supervisor. Students must submit an application for fieldwork by April 1 for approval to enroll in the fieldwork course the following fall quarter. *Prep., 53.845-.846, School Psychology Fieldwork I and II*

53.850 Consultation Seminar

Offers a review of various consultation models, including behavioral consultation, process consultation, and systems consultation. Study also examines current research in the field of counseling consultation. Particular emphasis is placed on the development of a personal consultation style and enhancement of consultation skills.

53.851 Career Counseling Seminar

Study focuses on three types of counseling experiences: career-education program planning, leadership of career-development groups, and vocational counseling. Learning activities include case studies and audiotapes of career counseling sessions, class discussions of local problems and their solutions, didactic instruction, and the implementation of an actual career-education program relative to the student's area of interest.

53.852 Advanced Theories of Behavior Change II

This course addresses the fundamental methods for constructively improving human behavior, as implicit within the three generic approaches to psychological theory construction, and provides an overview of Ludwig von Bertalanffy's general systems concept of psychology and its relations to allied sciences. The course is based on a format of selected readings, lectures, and student discussion. *Prep., 53.834 Advanced Theories of Behavior Change I.*

53.853 Philosophy of the Behavioral Sciences

Addresses such fundamental questions as "What is science? What are its essential methods of inquiry, particularly as they pertain to the behavioral sciences? What is the nature of knowledge gained through scientific investigation, and are there lim-

its to its usefulness?" Participants have the opportunity to examine the natural and empirical sciences through exploring theory, fact propositions, hypothetical deductive/inductive knowledge, laws, evidence, verification, reductionism, and allied ideas. *Prep., 50.815 Research Design in Education and 53.852 Advanced Theories of Behavior Change II.*

53.891 Thesis

A research activity that may be selected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

53.893 Doctoral Dissertation

Prep., admission to candidacy in the Doctor of Education degree program.

53.895 Institute in Counselor Education

(See general institute description on page 48.)

53.898 Workshop in Counselor Education

(See general workshop description on page 48.)

53.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep., approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)*

Speech-Language Pathology and Audiology

55.803 Cerebral Palsy

Neuromuscular involvements and concomitant language and speech disorders; intellectual deficits, psychological aspects, communicative disorders of a cerebral palsied population; testing, placement, and management of the cerebral palsied child with emphasis on a multidisciplinary approach. *Prep., permission of instructor.*

55.804 Neurological Bases of Communication

This course will provide the student the opportunity to acquire a basic understanding of neuroanatomy and neurophysiology as they relate to normal aspects of speech, hearing, and language.

55.805 Seminar: Voice Disorders

Etiology, symptomatology, and disorder complexes related to phonation. Special emphasis is placed on the philosophy and methods used in the assessment and treatment of voice disorders. *Prep., 55.812 Differential Diagnosis in Speech and Language Pathology and 55.816, Test Procedures in Speech and Language Pathology.*

55.806 Language Disturbances in Children

This course will emphasize current theories in language behavior and their practical application to the assessment and remediation of language disturbances in children. Lectures, discussions, and case presentations may focus on the following issues: what constitutes a language problem, what assessment tools and therapeutic techniques are currently available, and what underlying principles are involved in selecting and organizing the content of a remediation program. *Prep., 55.812 Differential Diagnosis in Speech and Language Pathology, 55.816 Test Procedures in Speech and Language Pathology, or permission of instructor.*

55.811 Clinical Management in Stuttering

This course will emphasize diagnostic techniques, a review of the current therapeutic approaches, consideration of the individual's need in therapy, and the process of behavioral and attitudinal change from within a psychodynamic framework. Also to be considered are termination, referral, and group therapy. *Prep., permission of instructor.*

55.812 Differential Diagnosis in Speech and Language Pathology

This course is designed to offer students the opportunity to learn formal and informal test procedures. *Prep., 55.816 Test Procedures in Speech and Language or permission of instructor.*

55.814 Clinical Audiometry I

The use of pure tone and speech reception instrumentation in hearing evaluation; the interpretation of results in the diagnosis of functional and organic disorders. Lectures, demonstrations, observations, and practicum. *Prep., Introduction to Audiology and consent of instructor.*

55.815 Clinical Audiology

Physical characteristics of hearing aids and their performance. Theoretical approach to selection and fitting of hearing aids, and analysis of hearing aid dispensing systems. *Prep., Introduction to Audiology and permission of instructor.*

55.816 Test Procedures in Speech and Language Pathology

The course is designed to offer students the opportunity to develop competence in administering and interpreting a variety of tests used in diagnosing communication disorders. Information relative to the case history and interview, as well as to formal test procedures and report writing, will be included. *Prep., permission of instructor.*

55.818 Pathologies of the Ear

Lectures and observations in the organic and neurological pathologies of the ear; e.g., otitis media, Meniere's disease, and

otosclerosis. Consideration of approaches to treatment (medical setting). *Prep., permission of instructor.*

55.819 Clinical Audiometry II

Specialized techniques (Bekesy, EEG, site of lesion battery, BSR, ENG); the results and interpretation in the diagnosis of functional and organic hearing disorders. Lectures, demonstrations, and observations. *Prep., Introduction to Audiology and Audiometry I and permission of instructor.*

55.820 Physiological Acoustics

Particular emphasis is placed on the biophysics of the hearing mechanism, especially in terms of actual clinical utility. Comparative anatomy and physiological analysis are stressed. *Prep., introductory courses in Speech and Hearing, and permission of instructor.*

55.821 Seminar in Audiology

Advanced study of the development of principles and theories associated with modern procedures and methods used in audiology. *Prep., permission of instructor.*

55.822 Seminar: Orofacial Anomalies

Etiology, symptomatology, and problems associated with orofacial anomalies. Emphasis will be placed on the speech, language, and hearing characteristics and the assessment and treatment of persons with orofacial anomalies. Psychological and social considerations and an analysis of the team habilitative effort will be presented.

55.823 Psychosocial Aspects of Communication Disorders

This course is concerned with the psychological, educational, and social aspects of communication disorders, particularly auditory impairment. *Prep., permission of instructor.*

55.824 Seminar in Speech Pathology

Individual research and/or critical review of the literature in some area of basic science, speech sound learning, language, voice, fluency, or multiple disorders, with special emphasis on the impact of deafness

on psychosocial development. Class presentation of material and class discussion may be included. *Prep., open to graduate students who have completed the equivalent of two quarters of graduate work in Speech Pathology and have the instructor's permission.*

55.860 Aphasia Rehabilitation

Emphasis on current attitudes toward therapy and new methods, clinical methods of evaluation which are preparatory to therapy, and observation of therapeutic methods. *Prep., 55.804 Neurological Bases of Communication and permission of instructor.*

55.861 Neuropathology

Application of functional neuroanatomy in comprehending the various disease processes involving the nervous system; cerebrovascular disease tumors or malformations, Parkinson's disease, multiple sclerosis, and others. *Prep., permission of instructor.*

55.862 Psychoacoustics

This course offers the student the opportunity to explore the relationship between acoustic stimuli and psychological responses to sounds. Particular emphasis is placed on the similarities and differences in the perception of normal hearing and among different types of impaired hearing. Major topics of study include a general review of the physics of sound, detection, discrimination, masking, binaural hearing, and speech perception. *Prep., permission of instructor.*

55.863 Advanced Study in Articulation Disorders

An exploration into advanced theories of normal and abnormal phonological development with emphasis on distinctive theory and on phonetic theories of speech production; direct application of theories to diagnosis and treatment of various phonological disorders. *Prep., undergraduate course in articulation disorders and permission of instructor.*

55.865 Seminar: Speech Science

Study focuses on current physiological, acoustical, and perceptual data used to describe both normal and disordered speaking populations. Research techniques and instrumentation in the field of speech science are also examined. The application of theoretical information from speech science to the diagnosis and treatment of communicative disorders is discussed. *Prep., 55.875 and 55.876 Advanced Clinical Practice I and II.*

55.866 Hearing Science Seminar

Individual research and/or critical review of the literature in the area of bone conduction of auditory signals, evoked response and audiometry, impedance and audiometry, cortical processing of auditory input, and other related topics. Students will be responsible for class presentations of researched material. *Prep., permission of instructor.*

55.871 Medical Perspective to Anatomical Correlates in Audiology

This course provides the student with the opportunity for hands-on experience with dissection of human temporal bones as an approach to learning temporal bone anatomy; physiology and neurology are stressed. Students may become familiar with dissection techniques, use of dissecting microscope, and will be required to observe actual surgical procedures in a hospital. *Prep., permission of Department Chairperson.*

55.872 Medical Perspective to Anatomical Correlates in Speech Pathology

This course will provide the opportunity for hands-on experience with dissection of human larynxes as an approach to learning voice tract anatomy. Students may become familiar with dissection techniques, use of dissecting microscope, and may have an opportunity to observe actual surgical procedures in a hospital. *Prep., permission of Department Chairperson.*

55.873 Social Dialectology: Theoretical and Educational

This course focuses on the social and cultural influences on the language behavior and communication needs of the culturally "different" child. It emphasizes the interrelationship between linguistic structure and social structure and its implications for clinical intervention. *Prep., permission of instructor.*

55.874 Behavior Modification: Operant Procedures in Speech and Language Training

This course reviews principles and procedures of the functional analysis of behavior and focuses upon the application of behavioral theory and research to speech, language, and hearing training. It emphasizes clinical investigation in the experimental analysis of behavior of communication disorders and experiences in the application of experimental procedures in assessment and treatment programs. *Prep., permission of instructor.*

55.875 Advanced Clinical Practice I

A two-quarter sequence of supervised clinical experience in speech pathology and audiology designed for beginning graduate students. Practicum sites include the Northeastern University Hearing, Language, and Speech Clinic; satellite clinics; and/or educational settings. Students must be available a minimum of two days per week during the academic year. This course also requires attendance at on-campus seminar meetings held twice a month. *Prep., permission of clinical staff.*

55.876 Advanced Clinical Practice II

A two-quarter sequence of supervised clinical practicum in speech pathology and audiology at the Northeastern University Hearing, Language, and Speech Clinic; medical settings; educational settings; and rehabilitation centers. Practicum experience emphasizes advanced diagnostic and management techniques stressing the application of theory to practice. Students must be available a minimum of two days per week during the academic year. *Prep.,*

55.875 Advanced Clinical Practice I and permission of clinical staff.

55.877 Advanced Clinical Practice III

A two-quarter sequence of supervised clinical practicum in speech pathology and audiology designed for advanced graduate students. Practicum experience emphasizes problem-solving techniques relevant to case management. Students must be available a minimum of two days per week during the academic year. *Prep., 55.876 Advanced Clinical Practice II and permission of clinical staff.*

55.878 Seminar: Communication Disorders

This course provides an exploration into the development of communication and communication disorders, with focus on early conversational interaction, children's discourse, and pragmatic intents. Emphasis is placed on deficient social bases and their effect on language performance as well as trends for clinical procedures and intervention strategies for language-disordered children. Communication is viewed as the ultimate goal of therapy. Course participants are expected to complete a research project on the development of communication and child discourse and its application to clinical assessment and intervention.

55.891 Thesis

A research activity that may be selected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

55.895 Institute in Speech Pathology and Audiology

(See general institute description on page 48.)

55.898 Workshop in Speech Pathology and Audiology

(See general workshop description on page 48.)

55.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep., approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration of the Directed Study.)*

Rehabilitation and Special Education *Rehabilitation Administration and Counseling*

56.950 Introduction to Rehabilitation

An overview of and orientation to the field of rehabilitation, including its historical development, legislative involvement, psychological implications, and sociological dimensions. Emphasis is placed on coordinating and integrating services as they relate to the field of rehabilitation as a community process.

56.951 Principles of Medical Rehabilitation

The wide spectrum of disabilities that could profit from rehabilitation, including orthopedic, neurological, medical, surgical, and mental disabilities. The course may also present basic principles of medical rehabilitation that administrators should know. Psychological aspects of disability also discussed.

56.952 Program Development in Rehabilitation

This course deals with the use of the rehabilitation model in program development for the physically handicapped, mentally retarded, emotionally disturbed, aging, welfare populations, youthful offenders, culturally disadvantaged, and other special community groups. Emphasizes the administrative involvement in developing and supporting the diagnostic, evaluative, counseling, and placement procedures used in such rehabilitative programs. Issues involving clinical program planning may be explored.

56.953 Organization and Administrative Theory

The body of conceptual knowledge regarding organizational and administrative theory will be examined. Formal and informal organizations, organizations as social systems, status and role concepts, leadership in organizations, power structure, relationships to authority, decision making, and communication in and between orga-

nizations. An organizational analysis will be made of all the different types of rehabilitation settings currently in use.

56.956 Community Planning in Rehabilitation

What administrators need to know about community planning to develop programs in their areas. Basic principles of community planning, organization, and dynamics, as well as interdisciplinary relations in rehabilitation. Examples of community planning from different rehabilitation agencies and the referral process among these agencies will be studied.

56.957 Federal-State Relations in Rehabilitation

The complex network of federal-state relations and their implications for rehabilitation. Grant procedures, matching formulas, public relations and RSA directives, state and federal legislation pertinent to rehabilitation.

56.958 Social Welfare and Rehabilitation

This course attempts to acquaint administrators, counselors, and other human services personnel with the broad field of social welfare. The course reviews the historical background of the relationship between vocational rehabilitation and social welfare and the more recent developments in the relationship of these fields.

56.959 Program Evaluation in Rehabilitation

The emphasis in this course will be on administrative research, program evaluation, grantsmanship, etc. In addition, students will have the opportunity to develop a research design on some aspect of rehabilitation administration and carry out the necessary research operations involved.

56.960 Practicum in Rehabilitation

(8 q.h.)

Students are usually assigned to a variety of rehabilitation agencies for their practicum experience. Problem solving relevant to experiences encountered in internship. A seminar may be regularly

conducted by a senior faculty member in conjunction with the practicum experience. This seminar offers students an opportunity to share their fieldwork experiences and resolve problems in rehabilitation which are connected with their field placements. (Two sections of this practicum are offered—one for those majoring in Rehabilitation Administration and one for those majoring in Rehabilitation Counseling.)

56.961 Fiscal Policy and Management I

An introduction to the concept of fiscal and managerial control. Areas to be covered may include accounting and budgetary procedures, need surveys, goal-setting practices, recruitment, staffing, training, professional development, caseload management, program planning, utilization of research, leadership patterns, performance appraisal, and external relationships. Case method approach may be used in classroom exercises.

56.962 Administration of a Sheltered Workshop

Special problems of administering a sheltered workshop, such as community planning, work evaluation, job training, labor relations, contracting, production, and occupational placement.

56.963 Fiscal Policy and Management II

Understanding the fiscal management of the typical rehabilitation setting, including basic rehabilitation agency accounting, planned program budgeting, disbursements, cost analysis, contracting, taxation, forecasting, and funding. The implication of data processing for fiscal management is covered in the course. Special problems will be assigned during the course.

56.964 Legal Aspects of Rehabilitation and Special Education

This course is designed to sensitize rehabilitation administrators, special educators, rehabilitation counselors, and other personnel to the impact of legislative developments upon the field of rehabilitation and special education. Special emphasis is

placed on understanding the legal implications for rehabilitation of the latest Vocational Rehabilitation Administrative Amendments, workmen's compensation laws, eligibility determination criteria, and Social Security Amendments. Latest federal and state special education legislation is covered.

56.965 Occupational Placement

A study of the dynamics of moving the rehabilitation client into the world of work within the framework of the specific community structure. Development of facility in use of resource materials in occupational information, job description and analysis, performance appraisal, training, and vocational assessment. The personnel point of view of the handicapped individual is discussed and analyzed, and more effective placement practices developed.

56.966 Evaluation of Deaf Rehabilitation Clients

Methods and techniques of psychological and vocational evaluation for deaf rehabilitation clients, including evaluation of client biographical characteristics, evaluation interview, and psychometric assessment. Required of all students in Deafness specialization of Rehabilitation Counseling program. *Prep., 53.801 Tests and Test Procedures and 55.829 Foundations of Deaf Education.*

56.970 CAGS Rehabilitation Practicum

Students are usually assigned to various rehabilitation agencies, where they are expected to spend 250 clock hours under appropriate supervision. A seminar with regular faculty members is conducted twice each quarter.

56.980 Psychological Problems of Disability

An advanced course in psychopathology as it relates to the impact of disability on personality. In-depth study of the moderately and severely handicapped from the viewpoint of psychosocial factors, interpersonal relationships, and cognitive versus noncognitive functioning in those with motor and

sensory disabilities; problems of dependency and motivation; role of psychosomatic factors. Some discussion of the role of treatment and rehabilitation.

56.981 Administrative Problems in Rehabilitation

Seminar designed to analyze, in depth, critical issues and selected rehabilitation problems. Operations and systems research as applied to rehabilitation will be highlighted. Students are offered the use of institute research studies and studies available through social and rehabilitation services, completed research, and demonstrative projects.

56.982 Essentials of Case Management and Supervision

The relationship between case management and casework supervision. Topics are the dynamics of the communication process, decision making, conflict, resolution and compliance, management of resources external to the organization, structural and functional analysis of supervisory process, and caseload management.

56.983 Rehabilitation of the Alcoholic and Drug Dependent

A study of comprehensive factors, including the nature of etiology dynamics involved in alcohol and drug dependency; techniques for evaluation; rehabilitation administration, planning, and treatment.

56.984 Rehabilitation of the Penal Offender

The rehabilitation of the penal offender is examined from an eclectic point of view. Psychodynamic elements are stressed, as well as social factors in the etiology, evaluation, and treatment and rehabilitation seminar planning and administration.

56.985 Rehabilitation of the Geriatric

This course presents a comprehensive treatment of the problems, dimensions, and parameters involved in the administration of the various services and facilities

for the rehabilitation of the geriatric. Special emphasis is on the philosophy of rehabilitation versus disengagement.

56.986 Critical Issues in Rehabilitation Administration

This course is built around the exploration and in-depth discussion of current issues which are highly problematical to the field. Among these issues are the breadth of the concept of disability, appropriate training sequences for the various rehabilitation disciplines, resolution of conflict over role overlap among disciplines, appropriate models for service delivery systems. The most current and relevant research may be brought to bear upon these areas, as well as knowledge from the reservoir of experience of instructors, visiting experts, and the student participants themselves. Students will be exposed to the issues as they exist in the profession and in the community. A theoretically oriented frame of reference will be brought to bear upon problems when feasible.

56.991 Thesis

A research activity that may be selected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

56.993 Doctoral Dissertation

Prep., admission to candidacy in the Doctor of Education degree program.

56.995 Institute in Rehabilitation Administration

(See general institute description on page 48.)

56.998 Workshop in Rehabilitation Administration

(See general workshop description on page 48.)

56.999 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep., ap-*

proval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)

Special Education

56.801 Alternatives for Mainstreaming Individuals with Special Needs

This course is for administrators, teachers, and specialists who are involved with mainstreaming individuals with special needs. Alternatives in decision making and program development, implementation, and evaluation may be explored with members of various disciplines who provide services for special needs children.

56.807 Educating Individuals with Learning Disabilities

This course surveys behavioral and social-emotional characteristics of individuals who manifest specific deficits in perceptual, integrative, or expressive processes that impair learning. Current service delivery programs, individual learning styles, and related curriculum materials for elementary through high school-aged, learning-disabled students are also analyzed.

56.808 Review of Current Methodology and Research in Learning Disorders

This advanced course is designed to help develop the following competencies in relation to educating learning-disordered individuals (early childhood through adulthood): use of task analysis and learning style to develop comprehensive individual education plans (refinement of skills developed in 56.807); use of current research to evaluate techniques of intervention (e.g., behavior modification and drug therapy for hyperactive children); review of current research to evaluate assessment techniques (e.g., effectiveness of available tests for learning disorders; ability to administer, score, and interpret tests useful in identifying learning disabilities; use of prescriptive techniques and materials for learning disabilities). Selection of

topics within competency areas may be individualized for students, based on previous course work and experience. *Prep., 56.807 Educating Individuals with Learning Disorders and 50.815 Research Design in Education.*

56.809 Development and Implementation of Programs for Learning Disorders

This advanced course helps to develop required skills for resource room and diagnostic-prescriptive teachers and special needs consultants to the regular classroom. Projects for the course include needs assessment for various special needs programs, development of a screening and diagnostic test battery, development of a diagnostic-prescriptive procedure for a specific population, development of in-service programs, development of a plan for educational group management. Projects may be selected by students according to their particular needs. Students in this course should be experienced in working with individuals with special needs. *Prep., 56.807 Educating Individuals with Learning Disorders and 56.846 Assessment in Special Education, and 56.847 Diagnostic-Prescriptive Teaching.*

56.831 Education of Individuals with Behavioral Disorders

A study of the various theories, programs, and approaches dealing with emotional disturbance. Emphasis is on the role of the educator as it relates to the therapeutic management of individuals and groups displaying problems in socio-emotional development. Parent-teacher interaction is also discussed.

56.832 Group Dynamics

Emphasis on understanding group growth, behavior, and action fundamental to developing solutions to the complex problems of group life. Students are given the opportunity to learn to examine their strengths and weaknesses, to examine group leadership styles, to become alert to new ideas and actions, to discover the pulse of a group, and to analyze reasons for one group's productivity and another's nonproductivity.

56.833 Mental Health

Study of conditions leading to optimal social adjustment. Consideration of the relationship between the maturation process and mental health, possible predeterminants of maladjustment, and factors which encourage the attainment of emotional maturity. Special emphasis is on the role of the school. Contributions from the fields of psychiatry, psychology, sociology, physiology, and medicine may be synthesized and evaluated.

56.834 Case Conferences: Individuals with Special Needs

This course is conducted as a seminar in connection with the student's practicum. Case presentations by outstanding resource persons are thoroughly examined and discussed. Students will also be expected to make their own case presentations to the seminar. *Prep., 50.807 Abnormal Psychology and 56.831 Education of Individuals with Behavior Disorders.*

56.835 Socio- and Psychodynamics of Family Life

Consideration is given to the internal and external dynamics of family life and the significance of such dynamics to the mental health of handicapped individuals and their families. Emphasis is on the impact of disability of family functioning and integration. Approaches to working with parents of special needs groups may be explored from psychodynamic, social learning and systems viewpoints.

56.837 Seminar: Problems of the Behaviorally Disordered

This course provides an intensive study of the special problems of the behaviorally disordered child. It gives seminar students the opportunity to proceed in depth in areas of special interest. Special attention focuses on problems presented by the autistic child, the neurotic child, the child with character disorders, the child with psychosomatic disorders, and the multi-handicapped child. *Prep., 56.880-.881 Etiology and Development of Special Needs.*

56.838 Development and Implementation of Programs for the Severely Handicapped

Course work includes observation of severely handicapped persons in the classroom and community; demonstration of evaluation and assessment techniques; and analysis of developmental, educational, and rehabilitation plans for severely handicapped persons. *Prep., 56.840 Psychology of Individuals with Special Needs.*

56.839 The Severely Handicapped

A review of handicapping conditions and consideration of the implications of severe multiple handicaps. Students will develop a case study of a severely handicapped person in conjunction with a review of relevant literature. *Prep., permission of the instructor.*

56.840 Psychology of Individuals with Special Needs

A study of the social and emotional adjustment of the handicapped and of the psychological significance of mental, sensory, and motor variations. The effects of limitations imposed by attitudes of society, the attitude of individuals toward their handicaps, and the effect of the handicap itself are evaluated. Implications for educational programs are analyzed. (This course should be among the first taken in the Special Education sequence.)

56.843 Evaluation and Education of the Vocationally Handicapped

Designed to develop fundamental skills in the evaluation and teaching of activities related to the vocational development of disabled individuals. Work sample and other techniques are used to assess levels of skills. Focus is on activities such as home management, use of tools, household repairs, basic sewing, essentials of food preparation, and activities of daily living (ADL). Visits may be made to sheltered workshops and vocational adjustment centers.

56.845 Rehabilitation and the Special Education Teacher

This course is designed to deal with effective working relationships between rehabilitation professionals and special education teachers. Elementary and secondary school personnel concerned with children with special needs will also find the course pertinent. Consideration is given to current legislation (Massachusetts Chapter 766) and its implementation, the teacher's role in rehabilitation, understanding of the total rehabilitation process, and rehabilitation resources available to school personnel.

56.846 Assessment in Special Education

This field-based course offers students the opportunity to learn to administer selected norm-referenced tests for special needs populations, determine which tests will yield the most information in a variety of case studies, and interpret data obtained from a minimum of four norm-referenced test batteries.

56.847 Diagnostic Prescriptive Teaching

Course instruction in this field-based course focuses on the following broad areas: development and implementation of individualized educational plans, including task analysis, annual goals, and short-range objectives; educational strategies and their application in classroom management; adaptation and selection of materials and strategies in various academic areas; perceptual-motor skills; and social-emotional interventions.

56.848 Early Childhood Learning Problems: Identification and Program Development

Informal and formal screening and assessment procedures suitable for an early childhood population are evaluated. Students will be required to work with young children in order to acquire experience with screening and assessment techniques. The resulting information may then be used to develop programs to meet the needs of individual children. *Prep., 56.846 Assessment in Special Education.*

56.849 Special Education for Gifted Children

Identification, characteristics, and problems of gifted, creative, and talented children and youth. Emphasis on administrative and instructional adjustments needed to provide for this group of exceptional children.

56.850 Fieldwork and Seminar with Special Needs Children

56.851 Student Teaching and Seminar with Special Needs Children (4 q.h. each)

The courses are scheduled to extend over a full year in a series of experiences as observer, tutor, and teacher. Students must make available approximately 250 hours or two days per week for two quarters for fieldwork, then approximately another 250 hours or four days per week for one quarter for student teaching. Students who are employed and who cannot devote full days to satisfy these requirements must arrange to be available evenings, weekends, and summers. Provision for attendance at biweekly seminars must also be made. Seminars are for the purpose of discussing with other students and professors the relevant issues confronted by teachers of special needs children. Outside speakers and programs may be arranged to extend this dialogue.

The adviser's written approval will be required before the student can do field placement or student teaching. The adviser's written approval is also required before students can obtain a waiver of student teaching.

All students, regardless of past experience, certifications, or letters of approval, are expected to do approximately 250 hours of fieldwork, set up and supervised by the University.

56.853 Fieldwork and Seminar

56.854 Practicum in Special Education (4 q.h. each)

The practicum is designed to satisfy Department requirements for field experience and extended practicum for SECP or other students who do not need certification. It extends over a full year and covers a series of experiences. Students must make avail-

able a minimum of two days per week for the first two quarters and five full days per week for the third quarter. Application for field placement is made two quarters prior to that for which fieldwork is planned.

Part-time students who are employed will need to make provision for a full quarter of fieldwork, five days per week, and for evening, weekend, or summer assignments to satisfy the requirement for field experience. Provision for attendance at seminars must also be made.

56.880–.881 Etiology and Development of Special Needs (8 q.h.)

The first quarter (56.880) concentrates on factors which primarily affect deviations in cognitive, motoric, and physical development. Understanding of these factors will be used to discuss multidisciplinary life-management issues relating to Down's Syndrome, cerebral palsy, and other common conditions.

The second quarter (56.881) concentrates on factors which primarily affect emotional development. Psychobiological, psychodynamic, and learning theory approaches may be discussed and related to problems of lifespan management. Community programs in addition to the more traditional intervention techniques are analyzed.

56.882 Seminar in Mental Retardation

A study of research in the field and its implications for teaching. Intervention strategies are studied and evaluated.

56.883 Seminar: Neuropsychology of Learning and Behavior Disorders

Through critical review of the literature, varied neuropsychological interpretations of the nature of learning and behavior disorders are analyzed and discussed. Topics related to the function of the brain and its relationship to behavior include biochemical and physiological correlates, cognitive and perceptual factors, genetic and maturational variables, hemispheric specialization, and implications of drug studies. Implications of the above for educating and serving special needs individuals are useful

to administrators, teachers, counselors, reading specialists, school psychologists, and those in allied health fields. Students will be expected to give a presentation in an area of interest related to the seminar topic. *Prep.*, 56.807 *Educating Individuals with Learning Disorders*, 56.880 *Etiology and Development of Special Needs*, 55.806 *Language Disturbances in Children*, and/or permission of instructor.

56.891 Thesis

A research activity that may be selected by the student in lieu of two courses (8 quarter hours), with the approval and recommendation of the adviser.

56.893 Doctoral Dissertation

Prep., admission to candidacy in the Doctor of Education degree program.

56.895 Institute in Special Education

(See general institute description on page 48.)

56.898 Workshop in Special Education

(See general workshop description on page 48.)

56.899 Directed Study

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Not available to special students. Prep.*, approval of the Chairperson of the Department and of the Director of the Graduate School. (Approval forms must be submitted during the quarter prior to registration for the Directed Study.)

Physical Education

62.810 Administration of Physical Education and Athletics

Physical education and athletics discussed as an entity consistent with the current emphasis on unity, economy, and equal opportunity. Modern practices and principles of general administration applied to problems of staffing, scheduling, budgeting, collective bargaining, personnel welfare, program development, and public relations. All levels of education and the broad spectrum of programs common to physical education and athletics are considered.

62.822 Problems in Contemporary Athletics for Men and Women

Current problems, practices, and national issues pertinent to the conduct of athletic competition. National, state, and conference organizations are studied.

62.830 Curriculum Development in Physical Education

The foundations of curriculum theory, research, practice, and evaluation in American education with specific application to physical education. Emphasis is placed on the processes of curriculum design and implementation in school settings.

62.833 Applied Evaluation in Curriculum and Instruction

Application of current educational evaluation theory to concepts of instruction and curriculum development in physical education. Includes formative and summative measures applied to the improvement of instruction, assessment of process and product in the educational program, interaction analysis. *Prep.*, 62.830 or 66.902.

62.835 Seminar in Curriculum and Instruction

Problems of special interest in instructional theory, curriculum theory, and applied evaluation theory. Practical papers and class presentations emphasize scholarship in the solution of problems or issues in health, physical education, or recre-

ation. *Prep., one course from the Curriculum and Instruction concentration in physical education; or 63.834.*

62.840 Advances in Instructional Concepts

Current practices in, and a search for new approaches to instruction in physical education. Includes analysis of teaching and learning styles, available instructional technology, and the implementation of instructional designs in physical education classes.

62.842 Physical Education for Students with Special Needs

Study of the movement problems and characteristics of special-needs populations. Assessment, planning, instruction, and evaluation practices recommended for work with special-needs students in physical education classes. *Prep., Adapted Physical Education or permission of instructor.*

62.845 Management of Adapted Movement Performance Programs

Analysis of legal, behavioral, and environmental concepts related to specialized physical education/motor development programs and investigation of national management systems. *Prep., 62.842 or 63.850 or equivalent graduate course.*

62.851 Anatomic Kinesiology

A study of the human musculoskeletal system and its relationship to human movement patterns. Electromyography is used in assessing muscle-movement relationships. Current electromyographic research and techniques are investigated. *Prep., Kinesiology or permission of instructor.*

62.852 Mechanical Analysis of Sport

Application of mechanics of motion to the analysis of human motion. Emphasis is placed on cinematography and film analysis procedures in teaching and research. *Prep., 62.851 Anatomic Kinesiology or permission of instructor.*

62.854 Physical Fitness Appraisal and Guidance

Physical fitness screening tests and procedures, developmental programs, fitness-producing activities, and current trends in testing and research. *Prep., Exercise Physiology and Measurement and Evaluation or permission of instructor.*

62.855 Exercise in Cardiovascular Health and Disease

Acute and chronic effects of exercise upon the cardiovascular, respiratory, metabolic, and muscular systems. Principles of human performance assessment and exercise prescription applied to adults in exercise-based prevention, intervention, and post-coronary programs. *Prep., Exercise Physiology or Advanced Physiology.*

62.857 Trauma Diagnosis and Treatment in Sport

An investigation of injury pathology, evaluative testing, diagnosis, and appropriate treatment modalities. *Prep., undergraduate Athletic Training or experience.*

62.859 Rehabilitation from Injury in Sport

Rehabilitation procedures and techniques appropriate to the post-injury retraining of athletes. *Prep., Adapted Physical Education or permission of instructor.*

62.860 Early Childhood Motor Patterns

An examination of observational and experimental aspects of developmental motor learning. The sequential development of motor skills and various factors contributing to motor control development, as well as current issues in movement development, are studied. *Prep., 62.884 Movement and the Learning Process or permission of instructor.*

62.864 Perceptual-Motor Development

A survey of the development of movement control from birth to maturity. Changes in motor performance due to age, motor development expected at various stages, and the interrelations of such factors as

growth, social context, cultural expectation, motor abilities, and sequential changes in motor control are examined.

62.867 Electrocardiography

A study of basic and intermediate electrocardiography, including cardiac function, lead systems, rate, rhythm, axis, infarction, ischemia, hypertrophy, effects of cardiovascular drugs, and purposes and principles of exercise testing. *Prep., 62.855.*

62.868 Laboratory in Exercise Testing and Prescription

Practicum in graded exercise testing, including determination of EKG, blood pressure, pulmonary, and metabolic response to exercise; pulmonary function testing; assessment of body composition; and tests of muscular strength, endurance, and flexibility; prescription of exercise for persons in cardiopulmonary prevention, intervention, and rehabilitation programs. Students are expected to do fieldwork as exercise technicians and leaders in prevention and/or rehabilitation programs. As part of the course requirements, each student must conduct a laboratory project. *Prep., 62.855 and 62.865 (62.865 may be taken concurrently).*

62.870 Philosophies in Physical Education and Sport

An exploration of major philosophies, past and present, and their influence on modern physical education and sport. Students are expected to delineate their personal philosophies, explore philosophical analysis as a research technique, and review philosophical research. *Prep., Philosophy, Philosophy of Education, or permission of instructor.*

62.872 Comparative Physical Education

Both past and present philosophies and practices of national and international programs in physical education are compared. Historical analysis is introduced as a research technique.

62.880 Sociology of Sport

An analysis of the sociological principles and factors operative in the interaction between sport and society. Pertinent literature and research are reviewed. Topics of discussion include the pervasiveness of sport, social stratification, politics, economics, sport and the mass media, race, women, violence, competition, deviance, subcultures, and sport in the future. *Prep., General Psychology or permission of instructor.*

62.882 Psychology of Coaching and Sport

The psychodynamics of the athlete and the coach, with particular reference to personality, maturation, motivation, learning, emotions, and perception. Individualized projects are required. *Prep., General Psychology or permission of instructor.*

62.884 Movement and the Learning Process

An examination of the scientific method as applied to the learning and performance of motor skills. The course surveys a range of theoretical positions and includes laboratory experiences as well as the interpretation of motor-learning studies. Major variables affecting motor learning and performance are examined from several theoretical standpoints. *Prep., 62.864 Perceptual-Motor Development or permission of instructor.*

62.898, 62.899 Seminar/Workshop

Special seminars or workshops in physical education on topics of timely interest. Graduate credit may be granted for successful completion of a workshop, but credit may not be applied toward a degree program without the program adviser's approval. A maximum of eight quarter hours earned in seminars or workshops may be applied toward the degree.

Recreation and Leisure Studies

63.802 Contemporary Theories of Recreation and Leisure

An exploration of the various theories and philosophic concepts of recreation and leisure, as well as their relationship to, and implications for, work, play, recreation, and leisure in contemporary society. Survey of the sociocultural development and historical background of the recreation and park movement. *Required of all students in Recreation and Leisure Studies.*

63.805 Program Evaluation in Recreation and Leisure Services

Focuses on comprehensive systems for evaluating program effectiveness as they relate to the consumer of recreation and leisure services. Major emphasis is placed on developing an evaluation system for an agency of the student's choice. Case studies are drawn from the public, nonprofit, and commercial sectors. *Required of all students in Recreation and Leisure Studies.*

63.812 Seminar in Contemporary Issues and Problems in Recreation and Leisure Services

Discussion of national and international issues, current trends, and contemporary problems as they affect recreation services. *Required of all students in Recreation and Leisure Studies. Prep., 63.802.*

63.813 Practicum in Clinical Recreation

A minimum of seventy-five clock hours of supervised professional experience, required of those students who do not have a degree in Recreation and Leisure Studies or sufficient professional work experience. Students are assigned as interns to agencies or institutions that offer services in the area of therapeutic recreation and rehabilitation, community and municipal recreation, or commercial recreation. Credit not applicable toward degree.

63.814 Grantsmanship

A seminar in which the student has the opportunity to develop a grant proposal for

submission to a funding source chosen by the student. Government and foundation grant programs are explored.

63.816 Budget Analysis

Capital and operating budgets are analyzed using such techniques as cost-effectiveness and benefit-cost analysis, forecasting, and present value analysis. The concepts of depreciation, direct and indirect costs, and service volume are studied as they relate to pricing decisions. Focus is on improving management decisions.

63.826 Administration of Resident Camp Programs

An in-depth study of staffing, sanitation, and health; purchasing and storage of food, materials, equipment, and supplies; kitchen management; insurance, construction, and maintenance of buildings; and program areas as they affect resident camping programs. A study of nationwide goals and trends in the camping movement is included.

63.830 Advanced Organization and Administration of Recreation and Leisure Services

Patterns for the implementation of recreation and leisure services by school systems, voluntary agencies, national service organizations, municipal governments, and state and federal agencies investigated in depth.

63.834 Programs in Recreation and Leisure Services

An examination and evaluation of program content, leadership, administration, and facilities in recreation and leisure services sponsored under public, private, religious, industrial, and voluntary auspices.

63.836 Public Relations for Recreation and Leisure Service Agencies

The central purpose of public relations is to influence public opinion. This course focuses on practical and ethical aspects of public relations for recreation and leisure

service agencies. Case studies are drawn from the public, nonprofit, and commercial sectors.

63.840 Politics and Bureaucracy in Recreation and Leisure Services

Practical problems faced by recreation professionals in public service are investigated. Students study relationships between elected officials, bureaucrats, peers, subordinates, and supervisors in state and local governments.

63.842 Recreation and the Community School: Concepts and Practices

The role of recreation studied as an integral part of programming for the community school. An analysis of the community school concept with regard to philosophy, physical plant requirements, personnel, finance, and community involvement.

63.844 Leisure and Delinquent Behavior

Recreation studied as an intervention strategy to prevent and rehabilitate delinquent behavior.

63.850 Therapeutic Recreation Services for Individuals with Disabilities

An introduction to the nature and scope of therapeutic recreation, including a review of its history and recent advances in professionalization. The role of service delivery in various settings and the major issues confronting this professional specialization are examined.

63.852 Seminar on Programming in Therapeutic Recreation

An overview of systems analysis and design techniques and their application. Emphasis is on therapeutic recreation planning at the administrative level. *Prep., an undergraduate program planning course in therapeutic recreation.*

63.853 Therapeutic Recreation: Interaction and Intervention Techniques

The examination of a variety of therapeutic recreation styles and intervention techniques as they directly relate to an applied understanding of therapeutic recreation.

Particular attention is devoted to the use of observation and assessment techniques found in activities therapy. *Prep., 63.850 and 63.852 or permission of instructor.*

63.854 Observations of Therapeutic Recreation in Treatment Settings

Guided observation sessions under professional supervision in various clinical settings. Group seminars are held to familiarize students as to the role of the rehabilitation team. *Prep., 63.850 or permission of the instructor.*

63.857 European Mountaineering

An intense six-day course that covers the basic skills of technical climbing. The course is conducted by the International School of Mountaineering. English-speaking guides extend all students to the utmost of their abilities in various climbing situations: free climbing; ice climbing near Chamonix, France; artificial climbing; or mountain rescue. Climbing is done in a voluntary, relaxed manner with the purpose of learning to enjoy the mountains creatively and safely.

63.858 European Backpacking and Orienteering

A practical course in the basics of safe mountain living and travel on foot. Subjects covered include group leadership, fauna and flora of the Alpine environment, mountain geology, mountain first aid, and orienteering. Students have the opportunity to participate in several day hikes in the vicinity of Leysin, where scenic walking paths abound, and two extended backpacking trips in contrasting areas of Switzerland. The European style of backpacking differs greatly from the traditional American practice of tenting, employing Alpine huts and refuges.

63.859 Comparative European Recreation

A presentation of recreation, European style. Guest lecturers, movies, group discussion, and field trips help to present the Western European approach to recreation and sport. The critical contemporary issues of facility construction, program structure

and development, government support, and treatment of special populations are viewed through the European perspective and compared to the American scene. Among the topics included are recreation and tourism in a mountain society, the European club system, Swiss park construction, therapeutic recreation in Switzerland, mountain rescue, and tourism as a part of recreation. The outstanding recreation facilities of Geneva are visited during the course. A written test and paper are required.

63.898, 63.899 Seminar/Workshop

Special seminars or workshops in recreation and leisure studies on topics of timely interest. Graduate credit may be granted for successful completion of a workshop, but credit may not be applied toward a degree program without the program adviser's approval. A maximum of eight quarter hours earned in seminars or workshops may be applied toward the degree.

Physical Therapy

64.810 Practicum in Physical Therapy I

Practicum in supervised clinical practice within the specified specialty area. Students are expected to complete 240 hours of clinical experience in a health-care setting. *Required as a prerequisite in selected courses for those students who do not have a minimum of one year of clinical experience at the time of registration for these courses.*

64.813 Cardiopulmonary Pathophysiology

Lecture and laboratory study of anatomy, physiology, and pathophysiology for the cardiac and pulmonary systems as applied to the dysfunction and rehabilitation of the cardiopulmonary patient. *Prep., 62.855.*

64.815 Cardiopulmonary Diagnostic Techniques

An overview of the various non-invasive and invasive techniques for diagnostic purposes, including examination of these techniques as guidelines useful in determining the extent of cardiopulmonary damage, work capacity, and residual function. Techniques studied include electrocardiography, systolic time intervals, pulmonary function, laboratory test findings, and gas analysis. *Prep., 64.810, 62.855, or permission of instructor.*

64.820 Cardiac Rehabilitation Programs Phases I and II (2 q.h.)

Survey of various cardiac rehabilitation programs, their objectives, relevant medical considerations, indications, and contraindications. Topics for examination include referrals, organizational structure, proposal writing, liabilities, and insurance plans available for these two phases of rehabilitation. *Prep., 64.810 or permission of instructor.*

64.822 Pulmonary Rehabilitation Programs (2 q.h.)

Theory and practice of pulmonary therapy. Analysis of treatment procedures utilized

with medical and surgical respiratory patients. *Prep., 64.810 or permission of instructor.*

64.825 Surgical Conditions of Cardiac and Pulmonary Patients

Examination of current surgical treatment of cardiac and pulmonary anomalies in both the neonate and the adult. The techniques used in various surgical procedures are studied as well as preoperative, intraoperative, and postoperative patient management. The role of the physical therapist is also investigated extensively. *Prep., 64.810 Practicum in Physical Therapy I or permission of instructor.*

64.826 Medical Conditions of Cardiac and Pulmonary Patients

Investigation of medical cardiac and pulmonary dysfunctions related to acute and chronic pathologic changes. The etiologies of cardiac and pulmonary anomalies are examined extensively. Medical management of the patient, the most recent research, and the interrelationship between physician and physical therapist are discussed. *Prep., 64.810 Practicum in Physical Therapy I or consent of instructor.*

64.836 Basic Applied Neuroanatomy

Study of the human nervous system from a functional perspective, including analysis of components of the nervous system as they relate to common clinical problems. Emphasis is placed upon the therapist's role in recognizing and treating these problems. *Prep., Gross Human Anatomy or permission of instructor.*

64.837 Advanced Neuroanatomy

Anatomy of the nervous system is studied from a functional perspective. The course focuses on the role of the cortex, basal ganglia, thalamus, and cerebellum in regulation of tone control, sensation, and posture. Current and classic literature will be used. *Prep., 64.836 Basic Applied Neuroanatomy.*

64.839 Advanced Topics in Neurodevelopment

Examination and interpretation of both classic and current nonhuman and human research studies. Seminar format. *Prep., one year of clinical experience in neurology or 64.810 Practicum in Physical Therapy I or permission of instructor.*

64.840 Neuromuscular Physiology

Classic concepts of normal muscle and nerve structure and function. Clinical impacts of disease and injury on neuromuscular morphology and physiology are emphasized where appropriate. The course also gives the student the opportunity to become familiar with current theory that may be relevant to evaluation and management courses offered in the program.

64.844 Evaluation of the Neurologically Impaired Adult

The course provides a framework for analyzing motor dysfunction, based on the fundamental properties underlying movement disorders. This framework is then used to critique current evaluations of neurologic disabilities and to develop a rationale for a logical and comprehensive evaluation of the neurologically impaired adult. *Prep., 64.810 Practicum in Physical Therapy I or equivalent or permission of instructor.*

Interdepartmental Courses

66.802 Research Design and Methodology

Research methods and designs used in health education, physical education, physical therapy, and recreation education. Emphasis is placed on the development of research techniques, including the ability to define research problems; write hypotheses; review and interpret literature; apply research designs; organize, analyze, and present data; and draw relevant conclusions. *Prep., Statistics or permission of instructor.*

66.805 Planning and Developing Facilities for Physical Education and Recreation

The principles, terminology, and standards for planning, constructing, and using indoor and outdoor facilities for physical education and recreation. Integrated planning among all municipal departments is stressed.

66.814 Supervision of Professional Personnel

A study of contemporary personnel management as applied to staff in physical education, physical therapy, and recreation and leisure services. Emphasis is on task analysis, personnel practices, leadership, and evaluative techniques.

66.886 Critical Thinking and Evaluation in Physical Education and Recreation and Leisure Studies

Investigation of the acquisition of knowledge in two disciplines. Examination includes evaluating knowledge and practice through experiences in decision making, logical analysis, and critical thinking.

66.887 Introduction to Computer Uses for Professionals

Introduction to computer capabilities and limitations; selection of hardware/software; use of a line editor; introduction to system command language; and introduc-

tion to data processing through a packaged library program such as SPSS, BDMP, MINITAB or IMSL.

66.888 Computer Applications for Professionals I

Use of a full-screen editor and word-processing software for preparing/analyzing data and documents; use of system command language to control multiprocess programs; and introduction to MIS file design and use of an MIS software package. *Prep., 66.887 Introduction to Computer Uses for Professionals.*

66.889 Computer Applications for Professionals II

Use of existing software (MASS-11 DB, Super Comp); simulations for working through such problems as scheduling/facilities usage, recordkeeping, and general ledger/accounting; and survey/market research. *Prep., 66.888 Computer Applications for Professionals I.*

66.890 Thesis/Project I

Initiation of a scholarly investigation. Students are required to submit a written research proposal for approval by a thesis/project committee and to present an oral proposal at a college seminar. *Prep., 50.841, 66.802, completion of two courses in area of concentration, and permission of program adviser.*

66.891 Thesis/Project II

The investigation proposed in Thesis/Project I implemented with, and culminating in, an approved written report in thesis form. *Prep., 66.890 Thesis/Project I.*

66.894 Independent Study

Under the guidance and direction of a program adviser, students have the opportunity to develop and conduct projects related to their professional interests. These projects are reported in thesis format when appropriate. (Credit arranged with program adviser.) *Prep., written proposal and permission of program adviser.*

66.898, 66.899 Seminar/Workshop

Special seminars or workshops on interdepartmental topics of timely interest. Graduate credit may be granted for successful completion of a workshop, but credit may not be applied toward a degree program without the program adviser's approval. A maximum of eight quarter hours earned in seminars or workshops may be applied toward the degree.

66.901 Health Issues: Implications for Education

An analysis of selected major health issues in health education. Emphasis is on the importance of current research findings to health education programs in a variety of settings.

66.902 School Health Education Curriculum

A study of selected curricula for school health programs, emphasizing the organization of curriculum components into an effective approach to health promotion and disease prevention in the school setting.

An attempt is made to relate course activities to the needs of Massachusetts schools.

66.903 Educational Strategies in Health Education

An analysis of contemporary educational techniques, concepts, and approaches of importance to the health educator in a school, community health agency, or medical setting. The use of educational diagnosis in determining appropriate educational strategies is emphasized as the major means of preventing health problems and improving health status. Health behavior models are presented as a basis for educational diagnosis.

66.904 Contemporary World Health

A survey of the state of the world's health, the progress which has been made in improving global health status, and the difficulties yet to be overcome. The importance of "partners in health," as opposed to the solitary research worker, in reaching

the current health needs is emphasized. Study includes an examination of the contributions of WHO, UNESCO, UNICEF, and FAO.

66.905 Environmental Health

A review of the regional, national, and international status of the environment and its impact upon individual and community health. Major focus is on developing an understanding of the etiology of environmental problems such as overpopulation, pollution of air and water, radiation exposure, noise, and waste disposal.

66.906 Consumer Health

Analysis and evaluation of the concepts involved in the careful selection of health products and services. Areas for student exploration and study projects include decision making relative to the selection of health products and services, evaluating advertising, quackery, and protection against useless or dangerous products through consumer organizations.

66.910 Nutrition

A study of dietary nutrients and their influence on the health status of individuals at various stages of the life cycle. *Prep., Anatomy and Physiology or permission of instructor.*

93.801 Seminar in Early Childhood Education Theory and Practice

The seminar will provide students with the opportunity to focus on issues not specifically covered in other course work. Consideration will include such topics as health and nutrition, diagnosis of childhood diseases, classroom organization and management, referral of children with special problems, licensing, and financing. Emphasis on all these topics is relative to early childhood education and settings. Specialists on the various topics may assist in seminar teaching.

93.802--.803 Practicum in Early Childhood Education I and II (8 q.h.)

The early childhood practicum is a supervised teaching experience extending over three consecutive quarters. To fulfill the requirement, students must meet in practicum seminars for a total of twenty-four times during the placement. Assignment to practicum settings will be made through the Director of Field Placement in association with the practicum adviser. Practicum placements are made in accordance with students' backgrounds, experience, and progress in the program.

Institutes

50.895, 51.895, 51.896, 52.895, 53.895, 55.895, 56.895, 56.995, 62.898, 63.898, 64.898

A department may offer a special institute in a specific field of interest from time to time. The institute may be collaborative, offered by the several departments in the Boston-Bouvé College of Human Development Professions, and will usually include a special institute faculty drawn from resources outside the University, as well as from the Boston-Bouvé faculty. The institute focuses on a specific area of academic study and may be interdisciplinary in nature; it involves total time commitments on the part of participants in morning, afternoon, and evening sessions, five or six days per week, for one to eight weeks, depending upon the nature and scope of the institute. Institutes are customarily designed for participants who are currently employed in a common field of work and wish to receive additional preparation in new methods, new materials, and new content areas. Graduate credit may be granted for successful completion of an institute but may not be applied toward a degree program at the University without the approval of the departments in which students are doing their major field of specialization degree work. All institute participants must be degree candidates in

the Graduate School or must qualify, prior to registration, as special graduate students. *Prep., permission of institute instructor.*

Workshops

50.898, 51.897, 51.898, 52.898, 53.898, 55.898, 56.898, 56.998, 62.899, 63.899, 64.899

A department may offer a special workshop in a specific field of interest from time to time. Emphasis in the workshop is focused on the development of instructional materials or the resolution of practical problems within a single school or institutional setting. Workshops may also be held for a group of potential participants who are currently employed in a common field of work. Graduate credit may be granted for successful completion of a workshop but may not be applied toward a degree program at the University without the approval of the departments in which students are doing their major field of specialization degree work. All workshop participants must be degree candidates in the Graduate School or must qualify, prior to registration, as special graduate students. *Prep., permission of workshop instructor.*

Northeastern University is an equal opportunity/affirmative action educational institution and employer. Northeastern University is accredited by the New England Association of Schools and Colleges, Inc.



WALTON, MA 02154

1953

WALTON, MA 02154

NORTHEASTERN UNIVERSITY LIBRARIES DUPL



3 9358 01114443 0

NORTHEASTERN UNIVERSITY LIBRARIES



3 9358 01114443 0